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The influence of budget allocation by function on student retention of public community colleges in the sixteen states in the Southern Region Education Board

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THE INFLUENCE OF BUDGET ALLOCATION BY FUNCTION ON
STUDENT RETENTION OF PUBLIC COMMUNITY COLLEGES
IN THE SIXTEEN STATES IN THE SOUTHERN
REGION EDUCATION BOARD

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by
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ABSTRACT

Stakeholders of higher education expect a positive return for their investment. One of the measures of success for higher education is persistence; one of the measures of persistence is retention rate. One segment of higher education, community colleges, receives a significant outlay of public resources in terms of government appropriations, student financial aid, and individual investment. This study follows the framework of Ryan (2004) and Gansemer-Topf and Schuh (2006) who successfully created models using the allocation of financial resources to predict graduation and retention rates for four-year colleges. Using data from the U. S. Department of Education's Integrated Postsecondary Education Data System (IPEDS), this study examined the relationship between the allocation of financial resources and selected institutional demographics with freshman retention for community colleges. This study found no relationship between financial allocation and selected institutional demographics with freshman retention. In addition, this study found no predictive model using financial allocation to determine freshman retention, but found a minimally effective model by adding selected institutional characteristics as predictors. Further research adding additional predictors may discover an effective predictive model for freshman retention.

CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

One evening, the president of a public community college in the Southern United States sits alone in her office reviewing the stack of proposals sitting on her desk. At the beginning of the month, the Governor's office forwarded \$200,000 in one-time surplus funds for the college to use as it sees fit. The Governor's office wants to see improvements in retention rates and, subsequently, graduation rates for all public colleges. When the college president received word of the pending funds, she asked the heads of various departments on campus to write proposals of how they would use the funds to increase retention at the college. The Dean of Instruction, the Dean of Student Services, the Head Librarian, the Director of Facilities, and the Vice President of Finance — representatives of the major functional areas on campus—all submitted proposals. Now, the president is reviewing each request and trying to determine which one will give the college the best return on its investment. She thinks to herself, if only, there was some formula that would let me know how to best allocate the financial resources of the college to increase retention rates...

Rationale

The following rationale will establish a framework for studying if the allocation of financial resources at public community colleges in the Southern United States has an influence on freshman retention. This rationale will describe the importance of freshman retention, the role of public community colleges in higher education, community college budgets, the demographics of the Southern United States, and predictors of college retention.

Freshman Retention

Because approximately 46% of all students enrolled in community colleges depart during their first-year, student retention is important (Braxton, Hirschy, & McClendon, 2004). Student

retention, which research literature, also calls student departure, student persistence, academic persistence, or attrition, is an important issue for community college administrators and all of those who have an interest in the success of a community college. Those with an interest in community colleges include both internal and external stakeholders. Internal stakeholders include students, administrators, trustees, faculty, and staff. External stakeholders include parents, transfer colleges, accreditation boards, the area community, and businesses (Choban, et al., 2004).

Public colleges benefit greatly financially from retaining students. There is a direct positive relationship between enrollment and tuition and fees revenue; the more students enroll the more tuition and fees the school earns. Increased retention increases revenues generated from other indirect sources, including auxiliary enterprises, which includes bookstores, concessions, and vending. Student retention reduces operating costs for institutions because it is cheaper to retain students than to recruit new ones. Since enrollment drives government funding of public institutions, it follows that increased student retention benefits public institutions by providing additional funding from governmental sources. Retention also is an element of many higher education performance-funding formulas, which require meeting legislatively predetermined criteria (Dougherty & Hong, 2006). Another factor stressing the importance of student retention is that regional accrediting bodies and policymakers for colleges look unfavorably at schools that show low accountability success in retaining students (Southern Association of Colleges and Schools, 2005). In terms of accreditation, student retention is a major factor in evaluating the quality of the school. In short, low retention of students adversely affects many aspects of higher education institutions (ACT, Inc., 2009).

Student retention at higher education institutions is important to students and society. At the public level, high retention gives taxpayers a better return on their investment. Those who

persist with education after high school have an improved quality of life. Higher retention produces a better-trained and skilled workforce (Braxton, Hirschy, & McClendon, 2004).

Students who complete a higher education program are less likely to require government assistance and social services, to smoke, to experience arrest, and to serve jail time.

Additionally, completers of higher education they are more likely to have health and retirement benefits from employers, lower unemployment, and better health habits. As a group, those who persist with higher education save the government billions. Society benefits from increased participation in postsecondary education because those individuals are more socially active, more tolerant of others' opinions, and more likely to volunteer. Students who stick with higher education receive higher wages and pay more taxes; in fact, individual investment in higher education will pay for itself in less than 11 years. As an investment, student persistence in higher education clearly benefits the institution, individuals, and society as a whole (Carnevale & Desrochers, 2004).

Public Community Colleges

As uniquely American institutions, community colleges offer accessibility in terms of open academic admissions, well-situated locations, and lower student-to-teacher ratios. Public community colleges offer a lower cost of education per person to both the students and the entities that operate them. Community college faculty and the colleges themselves must meet the same rigorous accrediting standards as four-year schools. Community college students who transfer to four-year colleges are just as successful as native students of the four-year school, increase their earning power, and achieve career advancement (American Association of Community Colleges, 2010).

Forty-six percent or 11.5 million of the students enrolled in higher education attended 1,173 community colleges. Six and a half million of these students are enrolled in college-level

courses. Students at community colleges benefit from flexible course schedules, including weekends, nights, distance, satellite campuses, and online courses. Community college services range from specialized training for large employers, to English language instruction for recent immigrants, to recreational courses. The American Association of Community Colleges estimates that an additional five million students enroll in noncredit adult education or recreational courses (Eckel & King, 2007).

The cost advantages for community college students are substantial. In 2005-06, an average family only had to pay 4.6 % of its family income on community college tuition and fees; university students' families paid 10.4 % (Marks, 2007). Community colleges offer lower costs in room and board since most students live within 40 miles of campus. Many students choose the financial advantages of living at home, community college students live an average of 190 miles closer to home than the average four-year student. Of course, there is a payoff; for every year a student attends a community college, her or his salary increases 5% to 8% compared to those with just a high school diploma (Kolesnikova, 2010).

Community college significance is increasing in workforce development. The U.S. Government Accountability Office (GAO), in a 2004 report on community colleges, reported that 61% of schools offer noncredit occupational, professional, or technical training (Government Accountability Office, 2004). The GAO also prepared a report recommending more integration of community colleges and one-stop career centers. The Workforce Investment Act established One-Stop Career Centers to provide a full range of assistance to job seekers under one roof. The centers offer training referrals, career counseling, job listings, and similar employment-related services (U.S. Department of Labor, 2005). As the report notes, "Through a variety of outreach, relationship building, and data collection efforts, community colleges have come to understand the specific training needs of key industries in their region and use this

information to keep programs current or develop new ones to address these needs” (U.S. Government Accountability Office, 2008, p. 3).

Long neglected and overlooked by education policy makers, community colleges are now emerging on the forefront as governments seek ways to provide the public with cost effective means of delivering higher education. As Obama administration Chief of Staff Rahm Emanuel stated:

The public has forgotten the importance of the community-college system to our economy, our ability to compete in a global economy. It is literally the conveyor belt to allow people to upgrade their skills when they are going from X job to Y career (Milanao, Reed, & Weinstein, 2009, p. 3).

Reinforcing the emphasis on community colleges, in 2009, President Barack Obama proposed the American Graduate Initiative (AGI). This plan showed the importance the administration places on improving America’s community college system by proposing \$12 billion in investment in community colleges with the goal of producing five million additional graduates with associate degrees and certificates. The AGI hopes to expand workforce development by increasing Pell Grant awards, modernizing and expanding college infrastructure, and developing better relationships with business and industry. President Obama’s goal is that the AGI will positively influence higher education in the same manner that land-grant colleges and the G.I. Bill (Serviceman’s Readjustment Act of 1944) improved higher education (The White House, 2009). Also in 2009, The Bill and Melinda Gates Foundation pledged \$30.5 million to improve community colleges. This grant will work to improve success with remedial education, low-income completers, graduation rates, accountability, and proficiency in technology. Usually, donors only give gifts of this significance to four-year universities (Bill and Melinda Gates Foundation, 2009).

In short, community colleges offer accountable and affordable higher education. These institutions offer responsive programming to millions of Americans who otherwise would not have the opportunity to enroll in postsecondary education.

Community College Budgets

Accounting standards require colleges and universities to report spending data by core activities or function classification. The Financial Accounting Standards Board defines functional classification as “a method of grouping expenses according to the purpose for which costs are incurred. The primary functional classifications are program services and supporting activities” (Financial Accounting Standards Board, 1993, p. 67).

The National Association of College and University Business Officers (NACUBO) define the transactions that comprise each functional classification (National Association of College and University Business Officers, 2010). Education and General (E&G) expenditures include those costs associated with services or goods that are utilized in the provision of instruction, public service, academic support, student services, institutional support, operation and maintenance of plant, and scholarships and services. NACUBO has other functional classifications, including research, public service, and hospitals, but these expenditures only account for 1.6% of total expenditures by community colleges (Knapp, Kelly-Reid, & Ginder, 2009).

The spending and budget allocations by functional classification of institutions of higher education reflect the values and priorities of the school’s administration and other policymakers (Hovey, 1999). It follows that if a school’s administration sets a specific outcome as priority, the administration will align its spending by functional classification to achieve the desired outcome.

Community Colleges in the Southern United States

It is common for academic studies to place an emphasis on a specific geographic region. One definition of a region is an area that has proximity and a high degree of social and economic

integration (Rowntree, Lewis, Price, & Wyckoff, 2006). The focus of this study is public community colleges in the Southern United States.

For the purposes of this study, the Southern United States includes the same states that are members of the Southern Regional Education Board (SREB). The states included in the SREB are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. These states, which contain 36.2 % of the United States population located in the contiguous southeastern United States (Southern Regional Education Board, 2009).

The SREB describes itself as

a nonprofit, nonpartisan organization based in Atlanta, Georgia, that works with 16 member states to improve pre-K-12 and higher education. SREB's many programs and initiatives share a single, powerful mission: to help the region lead the nation in educational progress (Marks, 2007, p. 2).

Many policymakers in southern states use the SREB data to evaluate, among other objectives, the appropriate state funding for higher education, the adequacy of instructor and staff salaries, and student academic achievement and progress. This organization also assists state and campus leaders by directing attention to key education issues; collecting, compiling, and analyzing comparable data on many levels of education; and sharing its analyses of actions and issues that help states and institutions form long-range plans and policies. Many state policymakers base higher education funding formulas on SREB data (Public Affairs Research Council of Louisiana, 2003).

In terms of socio-economic descriptors, when compared to the rest of the United States, a citizen of a SREB state is: 1) less likely to have a high school diploma or a bachelor's degree and to graduate from high school on time; and 2) more likely to have a lower median annual income, to be classified as a racial minority, to receive free or reduced-price lunches in high school, and to live in poverty (Marks, 2007). The region also has lower median income, cost of living,

construction cost, land prices, and business operating cost than the rest of the United States.

These factors are relevant when studying the operating cost of public community colleges in the Southern United States.

Another organization that focuses on higher education in the Southern United States is the Commission on Colleges of the Southern Association of Colleges and Schools (SACS). SACS is the accepted regional accrediting organization for the 11 SACS states in the Southern U.S. for those institutions of higher education that award associate, baccalaureate, master's, or doctoral degrees. The states that are members of SACS include Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia. SACS accreditation is required for institutions to offer Title IV financial aid, such as Pell Grants or Stafford Student Loans, from the U.S. Department of Education. The fact that these two organizations, the SREB and SACS, exist to serve higher education in the Southern United States shows that this region is of enough significance for academic study.

Predicting Freshman Retention

Retention techniques are the focus of numerous studies with their roots in the works of Spady (1971), Bean (1990), Tinto (1975, 1993), Pascarella (1985), and Astin (1993). Various studies reveal the successful application of retention techniques, including peer counseling of minorities, before and after surveys of freshmen to determine retention factors, creating elaborate study centers, actively locating students who are considering withdrawing from school, pairing at-risk students with faculty mentors, to list some of many (Moore & Shulock, 2009). While there are many proven techniques to improve retention, the key point with research on higher education retention has shown that no single practice works best (Braxton, Hirschy, & McClendon, 2004).

Numerous predictive models for freshman retention in higher education exist. Most of these models focus on data from five main risk elements: academic, personal, life issues, institutional, and social. Academic risk factors include poor academic skills, poor study habits, and not seeing the value of higher education. Personal risk factors include stress, low self-esteem, and insecurity. Life issue risk factors include financial difficulty, job conflicts, and health problems. Institutional risk factors include poor instructors, scheduling problems, and unavailability of desired academic programming. Social risk factors included social isolation, involvement with college activities or faculty (Ness, 2004). The important observation relevant to this study is that none of these factors list allocation of financial resources at an institutional level as a risk factor for college retention.

Need for the Study

Student retention is a much-researched topic. Research ranges from theoretical approaches to practical application of techniques. Since retention research started in the early 1970s, top theorists have advocated various conceptual frameworks. These frameworks include advocating student integration into academic, social, and other proper institutional systems. Few studies focus on institutional expenditures and its impact on freshman retention (Ryan, 2004). This study will address the role of institutional expenditures in the retention of freshman students by community colleges.

Purpose of the Study

The purpose of this study was to determine if a predictive model exists that allocates budgets by functional classification in a manner that maximizes freshman retention for public community colleges in the Southern United States.

Objectives of the Study

The objectives of this study were as follows:

1. Describe the spending as a percentage of total expenditures by functional classification for public community colleges in the Southern United States. The functional categories include
 - Instructional expenses as a percent of total core expenses
 - Academic support expenses as a percent of total core expenses
 - Student service expenses as a percent of total core expenses
 - Institutional support expenses as a percent of total core expenses
 - Other core expenses as a percent of total core expenses
 - The fall-to-fall full-time retention rate as the dependent variable
2. Determine if a relationship existed between spending by each functional classification and the fall-to-fall retention rate of first-time full-time students.
3. Determine if a model existed that suggests the optimal financial allocation by functional classification to maximize first-year retention rates. This study will use the potential explanatory variables of financial allocation characteristics,
 - Instructional expenses as a percent of total core expenses
 - Academic support expenses as a percent of total core expenses
 - Student service expenses as a percent of total core expenses
 - Institutional support expenses as a percent of total core expenses
 - Other core expenses as a percent of total core expenses
 - The fall-to-fall full-time retention rate as the dependent variable
4. Describe public community colleges in the Southern United States by institutional characteristics, including:
 - The number of students enrolled in the institution

- The number of students enrolled part-time in the institution
 - The percent of total enrollment who are white non-Hispanic
 - The percent of total enrollment who are black non-Hispanic
 - The percent of total enrollment who are Hispanic
 - The percent of total enrollment who are women
 - The percent of undergraduate enrollment under age 18
 - The percent of undergraduate enrollment age 18 to 24
 - The percent of undergraduate enrollment age 25 to 64
 - The percent of undergraduate enrollment over age 65
 - The total amount spent on core expenses
 - The percentage of students receiving federal grant aid
 - The percentage of students receiving Pell grants
 - The percentage of students receiving federal loan aid
 - The number of full-time equivalent students
 - The amount of core expenses per full-time equivalent student
5. Determine if a relationship existed between additional institutional characteristics and the fall-to-fall retention rate of first-time full-time students.
 6. Determine if adding additional institutional characteristics created or improved a predictive model that suggests the optimal financial allocation by functional classification to maximize first-year retention rates. This study will use the potential explanatory variables of financial allocation characteristics listed in objective four, in addition to the variables listed in objective one.

Significance of the Study

All stakeholders of public community colleges in the Southern United States could benefit greatly if a predictive model exists that successfully optimize the allocation of financial resources by functional classification in order to maximize freshman retention. If such a model exists, policymakers, administrators, students, employees, and other stakeholders of community colleges could maximize scarce resources to increase first-year student retention, and all parties will reap the benefits of increased first-year retention.

Limitations

IPEDS is a self-reported dataset. As stated by Ryan (2004), “any self-reported data by institutions or individuals may contain some error. However, if any errors exist they may be random. Data checking and cleaning typically is part of the standard procedures used by these organizations and helps to protect sets from systematic errors.”

An additional weakness of IPEDS is that it collects and reports data in aggregate form. This aggregate approach of IPEDS for data collection and reporting prevents detailed study of retention and graduation rates at the institutional level. For example, IPEDS does not collect retention and graduation rates separately by gender, age, race, or type of financial aid. This approach to data collection is suitable for research of a population of institutions, but has limitations at the institutional level.

Definition of Key Terms

Attrition: Refers to the process of students dropping out of college, usually during the first or second year, and failing to reenroll at an institution in subsequent terms.

First-time first-year student: A student attending any institution for the first time at the undergraduate level. Includes students enrolled in the fall term who attended college for the first

time in the prior summer term. Also includes students who entered with advanced standing (college credits earned before graduation from high school).

First time student: Includes students who take courses as first-time freshmen during the summer session and continue as full-time freshmen during the following fall semester, whether those summer courses are taken at the reporting institution or transferred from another institution.

First-year college student: A student who has earned between one and 30 semester credit hours.

First-year retention rates: The percentage of first-year students who had persisted in or completed their educational program a year later.

Integration: Tinto's (1993) theory that examines the interactions between the student and his or her higher educational experience. Students undergo three stages to become integrated into the campus: separation, transition, and incorporation.

Persistence: The desire and action of a student to stay within the system of higher education from the beginning through degree completion (Seidman, 1996).

Retention: Ability of an institution to retain a student from semester to semester until a student graduates or otherwise leaves the institution.

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

This review of the related literature will start with an overview of the outputs of higher education and then cover how these outputs relate to the dependent variable for this study — retention rates. The review will then survey the historical setting of higher education and community colleges. Then this review will focus on specific elements of retention rates, including its various definitions, relevant terms, the methods of calculating retention, the relationship with graduation rates, and how retention data is collected. The review will also cover the major theories and theorists of retention and describe variables related to financial expenditures and their relationship to community colleges. This chapter will conclude with an account of studies in higher education on financial expenditures and their relation to retention or graduation rates.

The Outputs of Higher Education

The U.S. Department of Education considers retention an intermediate outcome measuring progression toward an ultimate outcome. The ultimate outcomes for higher education, which measures an institution's ability to deliver on stakeholder investment, are primarily graduation rates and degrees awarded. Intermediate outcomes, such as retention rates, measure an institution's progress toward an ultimate outcome (Moore & Shulock, 2009).

The financial input or investment by the U.S. government to higher education is significant. In 2009, the United States Department of Education spent \$115 billion dollars on direct financial aid to higher education. The \$115 billion budget included \$25 billion in Pell Grant awards, \$86 billion in student loans, and \$4 billion in work-study, academic supplements, and other Federal awards (U.S. Department of Education, 2009). The amount the federal government invests in higher education exceeds the \$63 billion, including \$14 billion to

community colleges, that state governments provided public institutions in 2007 (Knapp, Kelly-Reid, & Ginder, 2009).

The output American stakeholders expect from their investment in higher education is an outstanding return in benefits for individuals and society. Individuals expect graduates of higher education to, in part, have workplace readiness, general academic skills and to have domain-specific knowledge, skills, and soft skills — specifically, teamwork, communication and creativity, and student engagement with learning (Dwyer, Millett, & Payne, 2006). America's citizens expect the United States to keep the economic and global security leadership that the country has maintained for the last 50 years (Association of American Universities, 2006).

The Council for Higher Education Accreditation (National Center for Higher Education Management Systems and CHEA Task Force on Common Data, 2000) compiled a list of the 10 most common outcomes required by higher education accrediting agencies from America's colleges. These items include:

1) completion/graduation rates, 2) retention/attrition rates, 3) job placement in any field, 4) licensing/certification, 5) job placement in field of study, 6) type of placement, 7) undergraduate students enrolled in graduation programs, 8) unemployed or unknown status [with regard to job placement], 9) graduate students in postdoctoral positions or internships, and 10) the GPA of the graduating class (p. 2).

The Department of Education in its Spellings Commission Report (2006) states that America has additional expectations from higher education, including:

- We want a world-class higher-education system that creates new knowledge, contributes to economic prosperity and global competitiveness, and empowers citizens;
- We want a system that is accessible to all Americans, throughout their lives;
- We want postsecondary institutions to provide high-quality instruction while improving their efficiency in order to be more affordable to the students, taxpayers, and donors who sustain them;

- We want a higher-education system that gives Americans the workplace skills they need to adapt to a rapidly changing economy; and
- We want postsecondary institutions to adapt to a world altered by technology, changing demographics, and globalization, in which the higher-education landscape includes new providers and new paradigms, from for-profit universities to distance learning.

Higher education has the charge of preventing America from following behind the rest of world in science, math, and technology. The security payoff, or the moment in history, America never wants to never again have a “Sputnik”-like situation again. Sputnik was a Soviet satellite launched into low Earth orbit in 1958 that surprised the world. For many Americans, the success of Sputnik was strong evidence that the United States had fallen behind the rest of the world, particularly the Soviets, in terms of science and math. The success of Sputnik also suggested the Soviet Union had the capability to launch offensive missiles from inside Russia and hit targets inside the United States. Because of Sputnik, Congress created the National Defense Education Act (NDEA), which resulted in a multiplying of allocated resources to increase education and research in the areas of mathematics and sciences (Association of American Universities, 2006).

In terms of the threats to America’s economic future, the Association of American Universities (2006) issued the following warning if output in terms of number and quality of college graduates does not keep pace with the rest of the world:

Our nation also faces threats to its continued prosperity and global economic leadership. We face a long-term energy crisis, and we face growing competition from other nations — such as China and India — that are investing strategically in their manufacturing capabilities, expanding into service industries, and, most significantly, building state-of-the-art research institutes and universities to foster innovation and compete directly for the world’s top students and researchers. The concern is clear: If we remain on our present course, our nation will not be able to produce the well-trained scientific and technical workforce necessary to meet increasing competition in world markets (p. 7).

Graduation rates are a measure of the outputs of higher education. Alexander Astin (1993) created the Input-Environment-Output Model (I-E-O) in which he applied the systems model to higher education. According to Astin's model:

Input refers to the characteristics of the student at the time of initial entry to the institution; *environment* refers to the various programs, policies, faculty, peers, and educational experiences to which the student is exposed; and *outcome* refers to the student's characteristics after exposure to the environment (p. 7).

The benefits of higher education to society or individuals are limited unless institutions produce the ultimate output of quality graduates. Retention rates, the dependent variable of this study, relate to graduation rates in that they gauge an institution's progress toward producing graduates (Moore & Shulock, 2009).

Federal Support for and Development of Higher Education

Prior to 1970, college retention was not a commonly researched topic. In early America, colleges were small unstable private or church-operated enterprises more focused on remaining financially solvent and open for businesses than they were on student retention. These colleges were primarily concerned with preparing men from elite families for careers in teaching, medicine, law, or the ministry. The original purpose of higher education was to take "a young man from a privileged background who underwent preparation in a religious setting for a future career as a leader in either the church, law, or medicine" (Boning, 2007, p. 2). The original Morrill Land-Grant Act exemplifies the philosophy of the federal government's role in higher education in the mid-1800s. The act passed Congress in 1859, but President James Buchanan vetoed the bill at the urging of Democratic senators led by John Slidell of Louisiana. Buchanan justified the veto because it violated the traditional policy of the Federal Government, which until then had left control of education to the states (National Association of State Universities and Land-Grant Colleges, 2007).

In 1862, the Morrill Land Act finally passed Congress, calling for at least one college in every state and eventually creating 69 colleges throughout the United States. These colleges were required to teach agriculture, mechanics (now called engineering), and military science. While these colleges did not initially significantly increase college enrollment, they did radically increase access to higher education for all Americans (National Association of State Universities and Land-Grant Colleges, 2007).

In the early 1900s, institutions stabilized financially as college enrollment significantly increased. Industrialization was on the rise in America and an understanding of the science of agriculture was gaining acceptance and developing an economic demand. Soon enrollments increased in order to meet the need for college graduates to manage increasingly complex industrial and agriculture operations (National Association of State Universities and Land-Grant Colleges, 2007).

During the mid-1900s, three governmental policies fueled a significant increase in the demand for higher education. First, during the Great Depression, fearing that disgruntled youth were fertile ground for revolutionary politics, Eleanor Roosevelt lobbied her husband, President Franklin Roosevelt, to create the National Youth Administration (NYA). Created by an executive order in June of 1935, the NYA provided grants to high school and college students in exchange for labor. This allowed young people to stay in school while also preventing the number of unemployed youth from getting any larger (George Washington University, 1999).

The second policy was the Servicemen's Readjustment Act of 1944 or more commonly called the G.I. Bill. This bill provided college or vocational education for returning World War II veterans, \$20 a week for one year of unemployment compensation, and loans to buy homes and start businesses. According to the United States Department of Veterans Affairs, "Thanks to the G.I. Bill, millions who would have flooded the job market instead opted for education. In the

peak year of 1947, veterans accounted for 49% of college admissions. By the time the original G.I. Bill ended on July 25, 1956, 7.8 million of 16 million World War II veterans had participated in an education or training program.” (U.S. Department of Veterans Affairs, 2009, p. 2). It is also interesting to note that because the educational benefits of this act were so popular, veterans only used 20% of the funds set aside for unemployment benefits.

Two laws that continue to define the financial role in higher education of the federal government frame the third policy. These laws are the National Defense Education Act of 1958 (NDEA) and the Higher Education Act of 1965. The Cold War stimulated the first example of comprehensive federal education legislation, when in 1958 Congress passed the NDEA in response to the Soviet launch of Sputnik. In an effort to produce more highly trained individuals to help America compete with the Soviets in scientific and technical fields, the NDEA included provision for loans to college students and the improvement of science, mathematics, and foreign language instruction (U.S. Department of Education, 2010).

The Higher Education Act of 1965 (HEA), which Congress has amended many times, forms the basis of current law authorizing the federal student aid programs. “Title IV Programs” are contained in Title IV of the HEA, which are the student aid programs administered by the U.S. Department of Education. The HEA established federal scholarships for needy undergraduate students and made provision for government insurance on private student loans. The HEA consolidated laws authorizing the National Defense Student Loan Program and the College Work-Study Program to create two new programs: the Educational Opportunity Grant Program and the Guaranteed Student Loan Program (U.S. Department of Education, 2010).

A trend that is apparent from this narrative is that over the last century, involvement and investment by the United States federal government has increased dramatically and yet the return on this investment as measured by graduation rates remains flat. In 2006, the U.S. Department

of Education published a study cautioning the United States has fallen behind the rest of the industrial world in higher education attainment. “Where once the United States led the world in educational attainment, recent data from the Organization for Economic Cooperation and Development indicate that our nation is now ranked 12th among major industrialized countries in higher education attainment” (U.S. Department of Education, 2006)

Federal Support for and Development of Community Colleges

The history of community colleges tracks similarly to the federal involvement in higher education. In 1901, the University of Chicago opened the first junior college, Joliet Junior College, in Joliet, Illinois, “... as an experimental postgraduate high school program that academically paralleled the first two years of a four-year college or university. Joliet was designed to accommodate students who did not want to travel far to pursue a college education” (Joliet Junior College, 2010, p. 1).

From 1901 to the start of World War I in 1915, the number of community colleges grew from one to 74. During the war, the number of institutions and enrollment flattened. By 1921, the demand by returning soldiers for education increased the number of community colleges to more than 200. Because of increased industrialization of American manufacturing during the 1920s, the demand soared for college-educated workers to manage these plants. During this decade, the focus for community colleges shifted from exclusive liberal arts curricula to adding programming that was more technical in nature (Geller, 2001).

The Great Depression had a surprisingly positive effect on community colleges during the decade of the 1930s. From 1928 to 1935, enrollment in universities decreased because the financial collapse caused many families who saved for college to lose those savings. Franklin Roosevelt’s administration created “emergency junior colleges” that were established as evening programs in high school facilities. Federal Works projects benefited existing campuses with

construction projects for facilities. During this period, the original liberal arts program for university transfer fell in even less favor to technical programs because of demand for quick training for employment and because four-year degrees were not guaranteeing jobs (Geller, 2001).

World War II caused lean times for junior colleges. First, there was a drop in enrollment because many potential students were serving in the war. Second, students who enrolled in junior colleges, unlike students in four-year schools, were not eligible for a service deferment or draft exception. This decrease in student population caused a number of junior colleges to close (Geller, 2001).

After World War II, there was a huge growth in junior college enrollment. Former soldiers took advantage of the G.I. Bill, open admissions, and technical education to push junior college enrollments beyond their capacities. In 1946, President Truman appointed a commission to study the nation's two-year institutions and the resulting report pushed these colleges into the forefront of American higher education. One of this report's significant contributions was it popularized the term "community college" and it called for increased federal spending in the form of "scholarships, fellowships, and general aid" (Geller, 2001).

In 1948 when the Korean War started, junior college administrators feared that the schools would face the same enrollment hardships they faced during World War II. These fears were unfounded because Selective Service began granting draft deferments to all full-time students, including junior college students. In addition, an increased need in technicians for the emerging aerospace industry and a shortage of nurses caused a jump in junior college enrollment during the 1950s (Geller, 2001).

During the 1960s, the term *community college* started to gain acceptance and the schools increased in popularity. In 1970, community college enrollment had more than tripled since

1950. The dual mission of university transfer and providing career technical terminal degrees strengthened the image of and demand for community colleges. As Witt, (1994) stated:

While colleges hurried to recruit faculty and build new campuses, the student boom continued unabated. By the fall of 1970, there were 1,091 junior [community] colleges nationwide, an increase of 413 colleges in ten years. After discounting for colleges that were dropped, America had built nearly one community or junior college per week for a decade (p. 185).

Since the 1970s, community colleges have refined their comprehensive mission of university transfer, career and technical education, and providing continuing and community education. The various functions have continued to encompass academic transfer, technical education, continuing education, developmental (remedial) instruction, and community service activities (Kolesnikova, 2010).

In summary, the original goal of two-year colleges was to prepare students, through an associate's degree program, to transfer to a four-year college. Over time, the purpose evolved to include workforce training programs, schooling toward certification in areas such as nursing and other professions, and adult continuing education classes. A more recent development is that some community colleges now offer bachelor's degrees in a number of fields (Kolesnikova, 2010).

Freshman Retention

The concept of retention is simple; a student enrolls in school and returns in a subsequent semester. Retention describes the number of students who persist with their education at the same institution (Walleri, 1981). In discussing student retention, one of the problems associated with the topic is how to define and measure retention by each institution (Wild & Ebber, 2002). Noel-Levitz (2000), a college retention consulting firm, stated in its whitepaper, *Tired of Moving Mountains? Getting Retention Results Really Easy*:

Retention is an institutional performance indicator. It's a measure of how much student growth and learning takes place. It's a measure of how valued and respected students feel on your campus. It's a measure of how effectively your campus delivers what students expect, need, and want. In other words, retention is a measure of your overall product (p. 1).

The academic study of retention is more in-depth and has many nuances. In order to gain an understanding of the issues in the study of retention, one must grasp a few basic terms. The National Center of Education Statistics (NCES) states that *retention* is an institution's success in progressing students through an educational program. *Persistence* is a student's success in remaining in an institution. Retention differs from persistence, in that persistence focuses on the students' success, while retention refers to an institution's ability to keep a student. In short, students persist; institutions retain (Knapp, Kelly-Reid, & Ginder, 2009).

A student who remains enrolled in college until degree completion is a *persister*. A student who leaves college without earning a degree and never returns is a *non-persister* (Hagedorn, 2005).

Vincent Tinto (1987), a leader in the study of retention, uses the term *student departure* to describe retention. Tinto points out that a *dropout* is a student who leaves before achieving his or her academic goals and never returns. Tinto argues that anyone who returns to school is no longer a dropout and that the only time someone is formally a dropout is at the death of the student. A *stop out* is a student who appears to drop out, but returns to the original institution after a period of time has elapsed (Knapp, Kelly-Reid, & Ginder, 2009).

Swirling refers to students who have or are taking courses from several different postsecondary institutions before earning their bachelor's or associate's degree. Studies in 2005 estimate 45% of students in four-year institutions were swirling. Swirling is also common among community college students (ECMC Foundation, 2009).

Attrition is another term to describe retention. Attrition is a measure of the number of students who have left their studies at the university in a nominated period, making allowance for students who leave studies because of finishing a program of study and graduating. Students can withdraw from studies prior to completion for a range of reasons other than for lack of academic potential — including difficulties in balancing study and other commitments, financial problems, and various disadvantages. Attrition rates are the opposite of retention rates (Berger & Lyon, 2005, p. 14).

A university may lose students to attrition due to *dismissal*, when an institution requires a student to leave or sit out a designated time. With a permanent dismissal, students leave *involuntarily*, possibly for rules violations or failing to meet minimal academic standards. Sometimes, students' reasons for leaving are *voluntary*, because the students may transfer to another university, and that is termed *institutional departure*. *System departure* is the moment students make a decision to leave higher education as a whole (Berger & Lyon, 2005).

Retention rate is a measure of retention. Traditional measures of retention include term-to-term retention, year-to-year retention, community college students who transfer before completing a transfer curriculum and community college students who transfer after completing a transfer curriculum (Moore & Shulock, 2009). This study will use The Integrated Postsecondary Education Data System's (IPEDS) calculation of retention rate. IPEDS defines retention rate for two-year or less institutions as:

A measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. This is the percentage of first-time degree/certificate-seeking students from the previous fall who either reenrolled or successfully completed their program by the current fall (Knapp, Kelly-Reid, & Ginder, 2009, pp. B-5).

It is interesting to note, as discussed earlier in the chapter, the NCES distinguishes between retention and persistence. Yet the NCES uses the term persist to definite retention rate.

Retention rates use the number of students in a cohort as the denominator and the number of returning students in a subsequent period as the numerator of the rate (National Center for Education Statistics, 2010). This chapter will cover additional information about cohorts later.

The actual retention rate formula used by IPEDS for less than four-year schools is the number of students from the previous fall semester, plus the number of students who have completed a program, divided by the number of students in the original fall cohort, minus exclusions. IPEDS defines exclusions as:

Those students who may be removed (deleted) from a cohort (or subcohort). For the Graduation Rates data collection, students may be removed from a cohort if they left the institution for one of the following reasons: died or were totally and permanently disabled; to serve in the armed forces; to serve with a foreign aid service of the federal government, such as the Peace Corps; or to serve on official church missions (Knapp, Kelly-Reid, & Ginder, 2009, pp. B-2)

The IPEDS calculation of retention rate, stated as a formula, is as follows (Hagedorn, 2005):

$$\frac{\text{Number of students re-enrolled in the following fall}}{\text{Number of students in the fall cohort } \textit{minus} \text{ exclusions}} \times 100$$

Stephen Sheldon (1982), in an effort to add clarity to community college attrition, identified three categories of attrition. Those categories are *positive*, *neutral*, and *negative* attrition. *Positive attrition* includes students who dropped out after meeting their objective or who transferred to another institution. *Neutral attrition* includes students who left because of a job conflict or because of scheduling difficulties. *Negative attrition* includes students who were academically or otherwise unprepared for college work and, as a result, did not meet intended educational goals. Sheldon maintained that the institution influences only negative attrition.

Significant Cohorts in the Study of Retention

A cohort is “. . . a group of individuals having a statistical factor (as age or class membership) in common in a demographic study, such as a cohort of students” (South Carolina

Education Oversight Committee, 2010, p. 2). The NCES simplifies this definition as a specific group of students established for tracking purposes (Knapp, Kelly-Reid, & Ginder, 2009). “The most common cohorts studied are first-time/full-time, degree-seeking freshman students, and all beginning freshman students” (Office of Research & Policy Analysis, 2007, p. 1)

One of the more significant cohorts for community colleges classifies students as traditional and nontraditional. As is typical with the definitions of many cohorts, the definition of “nontraditional student” is not clear-cut. Age and part-time status are familiar delimiting characteristics (Bean & Metzner, 1985). An NCES study examining the relationship between nontraditional status and persistence in postsecondary education identified nontraditional students using information on their enrollment patterns, financial dependency status, family situation, and high school graduation status. The NCES defines a nontraditional student as one who meets any of the characteristic on the following list (National Center for Education Statistics, 2002):

- Delays enrollment (does not enter postsecondary education in the same calendar year that he or she finished high school);
- Attends part-time for at least part of the academic year;
- Works full-time (35 hours or more per week) while enrolled;
- Is considered financially independent for purposes of determining eligibility for financial aid;
- Has dependents other than a spouse (usually children, but sometimes others);
- Is a single parent (either not married or married but separated and has dependents); or
- Does not have a high school diploma (completed high school with a GED or other high school completion certificate or did not finish high school).

The NCES (2002) classifies “nontraditional” on a sliding range based on the number of the preceding characteristics present. Students are classified as “minimally nontraditional” if they have only one nontraditional characteristic, “moderately nontraditional” if they have two to three characteristics, and “highly nontraditional” if they have four or more.

A NCES (2002) study on nontraditional students showed a stunning 90% of community college students had at least one characteristic of “nontraditional” undergraduates as compared to 50% for private four-year schools. Fifty-nine percent delayed enrollment; 70% were attending part-time for at least part of the academic year; 54% were working full-time while enrolled; 63% were financially independent from their parents; 35% had dependents or were a single parent. The breakdown of community college students was 10% traditional, 90% nontraditional students, 15% were minimally nontraditional, 35% were moderately nontraditional, and 40% were highly nontraditional.

The Board of Regents of the University System of Georgia (Office of Research & Policy Analysis, 2007) classified traditional and nontraditional students into three groups. Traditional students were defined as those “who graduate from high school the same year as college matriculation” (p. 3). The group called “Traditional — Graduated High School One through Five Years Ago” were students who graduate from high school one to five years before college matriculation. The third group were “Non-Traditional — Students;” these were students “who graduate from high school more than five years before college matriculation” (p. 3).

Other significant cohorts studied include *full-time students*. The NCES (2002) defines a full-time undergraduate student as “a student enrolled for 12 or more semester credits, or 12 or more quarter credits, or 24 or more contact hours a week each term” (pp. B-2). The NCES defines a *part-time student* as “a student enrolled for either 11 semester credits or less, or 11 quarter credits or less, or less than 24 contact hours a week each term” (pp. B-4).

The NCES (2002) also defines *First time in college (FTIC)* or *first-time student undergraduate* as a “. . . student attending any institution for the first time at the undergraduate level. This includes students enrolled in academic or occupational programs and students enrolled in the fall term who attended college for the first time in the prior summer term, as well as students who entered with advanced standing (college credits earned before graduation from high school)” (pp. B-2).

A *full-year cohort* is a group of students entering “. . . any time during the 12-month period September 1 through August 31 that is established for tracking and reporting Graduation Rate.” This cohort is for “. . . institutions that primarily offer occupational programs of varying lengths. Students must be full-time and first time [students] to be considered in the cohort (Knapp, Kelly-Reid, & Ginder, 2009, pp. B-2).”

Race/ethnicity is another cohort commonly used. The NCES (2009) uses categories to describe groups to which “. . . individuals belong, identify with, or belong in the eyes of the community” (pp. B-4). According to the NCES, these “. . . categories do not denote scientific definitions of anthropological origins. A person may be counted in only one group.” The groups used by the NCES to categorize U.S. citizens and resident aliens (and other eligible noncitizens) are as follows:

- White, non-Hispanic
- Black, non-Hispanic
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaska Native

In 2006, the population of SREB states consisted of 63% white, 19% black, 15% Hispanic and 4% other (Marks, 2007). Members of the *bachelor's or equivalent degree-seeking cohort*

are students who have the stated intention of seeking a bachelor's degree upon entry. *Associates degree seeking* or *degree/certificate-seeking students* are “. . . students enrolled in courses for credit who are recognized by the institution as seeking a degree or other formal award. At the undergraduate level, this is intended to include students enrolled in vocational or occupational programs” (Office of Research & Policy Analysis, 2007, p. 4). *Matriculation term* is the first semester a student enters an institution. Examples of matriculation term for schools on the semester calendar include fall, spring, and summer (Office of Research & Policy Analysis, 2007). *Institutional retention* is the measure of the proportion of students who remain enrolled at the same higher education college or school from year to year (Hagedorn, 2006, p. 14).

Hagedorn (2005) describes *retention within a major or discipline* as another classification that has a limited view of the measurement. This cohort is the basis of viewing retention within a major area of study, discipline, or a specific department. An example is a “. . . student who declares engineering as a major but then switches to biology may be retained in an institutional sense but is lost to the College of Engineering” (p. 6). Hagedorn adds “. . . non-persisters in one discipline may earn a degree in another major within the institution of original entry and thus be institutionally retained but departmentally non-retained” (p. 6). Focusing on retention within certain majors, such as engineering, is of interest because of the difficulty in recruiting students and the predicted shortages of qualified employees in the science, math, and engineering fields. Engineering is a field of study with poor rates of retention, especially among female and ethnic minorities (Daempfle, 2003). Researchers can track retention within the major by specific colleges or universities, but Hagedorn (2005) states that no system exists to track departmental cohorts nationally, thus, departmental retention remains difficult to measure.

Tracking student progress once a student leaves an institution and reenrolls elsewhere is very difficult. Only eight states' management boards have systems or student unit record (SUR)

data systems in place to monitor individual academic progress (Ewell & Boeke, 2007). These SUR systems not only follow progress in the cohort's native institution, but also if an individual transfers to another in-state institution. However, even in these eight states, if any students were to transfer out of state or to a private institution, the SUR data system does not capture the fact that these students reenrolled elsewhere. This omission understates the success of the native institution in producing graduates. In order to capture the true picture of system or higher education retention, a large investment by individual states or the nation as a whole is required. This investment is necessary to develop a comprehensive and worthwhile tracking system (Cunningham, Milam, & Statham, 2005).

A comprehensive national and statewide SUR data system is essential for providing a true measure of system retention (Ewell & Boeke, 2007). One of the basic goals for community colleges is to prepare students to complete the requirements for transfer to a baccalaureate institution (Kolesnikova, 2010). However, the lack of a tracking system means that community colleges do not have an inclusive method for feedback on the quality of their outputs in terms of students who eventually do graduate from college. However, providing this information to higher education stakeholders will involve a very expensive and difficult to implement information system, which critics contend has privacy issues for students, as discussed later (Hagedorn, 2005).

System retention focuses on whether a student stays in college — any college. This measure does not focus on which school a student enrolls, but just the fact that the student enrolls in some institution of higher education. “Using system persistence as a measure, a student who leaves one institution to attend another is considered a persister. Therefore, system persistence accommodates the frequent occurrence of transfer or reenrollment at another campus, in another state, or in another institutional type (for example in a for-profit)” (Hagedorn, 2005, p. 15).

The smallest unit of analysis with respect to retention is *retention within the course*. This cohort measures course completion at a very detailed level. Studying retention at the course level allows specific determination of which courses are preventing students from progressing to completion. Known courses that hamper student progress toward completion are computer science, math, and physics (Rask, 2010). Colleges do not report specific course completion rates to any national tracking system (Hagedorn, 2005).

Other rates cohorts used to measure retention include *regional rates*, *national rates*, *short-term retention rates*, and *long-term retention rates*. The number of existing and combinations of cohorts are far-reaching (Office of Research & Policy Analysis, 2007).

The parameters of a cohort may vary according to the subject of interest, which creates the need for subcohorts. Subcohorts are a predefined subset of the initial cohort or revised cohort established for tracking purposes subcohorts (Office of Research & Policy Analysis, 2007).

Research has examples of how focusing on subcohorts can produce results that differ from the entire cohort. For example, most research indicated that low grades during the first year of college were associated with an increased rate of dropping out of college. However, part-time students with low grades were no more likely to leave school than other students with average grades. Credit accumulation was positively associated with college persistence for younger students (age 17-20), but had no effect on older students (25-65). Credit accumulation was more of a positive predictor of transfer for academically unprepared community college students than it was for better-prepared students (Moore & Shulock, 2009).

This in-depth, lengthy, and somewhat tedious review of the various cohorts used in retention research is important to understanding the options available for possible dependent variables in this study. Later in the chapter, this review will discuss the positives, criticisms, and limitations of the most frequently used cohorts in retention research.

Graduation Rates

The output for colleges that receives the most attention is *graduation rates*. Graduation rate closely relates to retention rate. Because a student must persist at a given institution to graduate, that institution's graduation rate is a measure directly dependent on retention rate (Gansmeyer-Topf & Schul, 2006). The graduation rate formula also uses the same cohort as the retention rate formula described previously for the denominator. As the Department of Education explains, graduation rates are required for disclosure and/or reporting purposes under the *Student Right-to-Know Act and Campus Security Act (SRK)* (National Center for Education Statistics, 2010). Federal and state governments are pressing colleges to provide more data demonstrating evidence of student outcomes and institutional performance. Although most states have not required reporting the outcomes of students tracked over time, the federal Government has done so, at least in a limited fashion with the development of the SRK performance measures (Bailey, Calcagno, Jenkins, & Leinbach, 2006).

In addition to graduation rates, the SRK signed on November 8, 1990, requires each institution that participates in any Title IV program to submit an annual report to the Department of Education containing, among other things, graduation/completion rates of all students and additional information about students who are receiving athletically related student aid.

The basis of the SRK act started in 1989 when Senator Bill Bradley, D-New Jersey, a former student-athlete, introduced the bill as a means to require colleges to make their graduation rates a matter of public record. There was public concern that student athletes were getting college scholarships but not graduating. In July 1991, NCAA research verified these fears. The NCAA found that football and men's basketball student-athletes graduated at a 42.1% rate, compared to 45.7% for the rest of student-athletes. For minority students, the problem was more

alarming: only 26.6% of black student-athletes graduated, compared to 52.3% for whites (Hawes, 1999).

The SRK also requires reports on campus crime and safety statistics (Student –Right –To –Know Act, 1990). The purpose of this law was to insist that colleges reveal campus criminal activity to prospective applicants so they can make a more informed decision regarding the suitability of the institution. NCES developed the graduation rate component of IPEDS to specifically to help institutions respond to these requirements (Hagedorn, 2005).

The graduation rate is calculated as the total number of completers within 150% of normal time, *divided by* the revised cohort, *minus* any allowable exclusions. The normal time for completion is defined as six years for four-year colleges (8 semesters or 12 quarters excluding summer terms) and three years for two-year colleges (4 semesters or 6 quarters excluding summer terms) (National Center for Education Statistics, 2010). The revised cohort for the SRK is full-time, first-time, degree-seeking enrolled students. Allowable exclusions include students who leave school to serve in the armed services, are on official church missions, or are with a recognized foreign aid service of the Federal Government (Student –Right –To –Know Act, 1990).

Research notes that the federal definition is a graduation rate and not a retention rate. However, the fall of the first-year of interest cohort is the basis for the denominator in the calculation of the graduation rate for both “four year” and “less than four year schools.” This denominator is the same as the denominator used in calculating IPEDS retention rates (Hagedorn, 2006).

Benefits and Limits of Retention and Graduation Rates

Literature indicates there are positives in using the graduation rate for policy decisions and evaluating student success. First, for community colleges, it is the only outcome measure used

by all schools and it is easily available. Second, while critics of the graduation rate calculation claim the formula uses too narrow a definition for students or cohorts in its calculation, studies on community colleges suggest changing the cohort makes little difference in the rankings of institutions in comparison to other institutions. A third positive aspect of using graduation rates is that statistical methods make it possible to control for varying state inputs or resources and for the differing academic characteristics for students attending an institution. Fourth, the graduation rate calculation is useful in setting internal benchmarks for a single institution measures (Bailey, Calcagno, Jenkins, & Leinbach, 2006).

Critics of the graduation rate contend the cohort definition is too vague. The calculation excludes part-time students and students who transfer to another college and then graduate, ignores institutional selectivity or the quality of students at the institution, and ignores the personal wealth of the students attending a college. The formula does not take into account that community college students often do not intend to graduate and, at the community college level, limiting the formula to three years for graduation is too short a period to measure accurately student success (Bailey, Calcagno, Jenkins, & Leinbach, 2006). Critics also contend that the measure does not take into account the difficulty of an institution's programming and punishes institutions for taking high-risk students (Lombardi & Capaldi, 1997).

Measures of student success are generally limited to reports about graduation, retention, and transfer rates, but these measures do not fully capture and understand student progress and degree completion in higher education. Users of this data need to understand these measures have limited value in providing information on how to improve student retention and graduation rates. Measures reported in IPEDS only provide information for full-time students beginning in a fall term, and only provide information on retention and graduation for institutions where a student initially enrolled. This approach to measuring student success excludes a large number

of students. The fact that a student can have success in college allows the term “purposeful migration” to replace the negative term “swirling” to describe students who attend more than one institution to obtain a college degree (Adelman, 2006).

The IPEDS measures of retention and graduation are difficult to apply to community college students because a large percentage of these students undertake nontraditional attendance patterns. Because of the limited ability to collect and determine entering students’ objectives for enrolling in a community college, there is a special challenge in collecting data that shows the success or lack of success represented by community college students transferring to a university (Adelman, 2005).

The reasons students enroll in a community college are varied. Some enroll for personal enrichment, to complete developmental courses, to learn additional skills, to complete a certificate, or to transfer to a four-year school, before or after obtaining an associate’s degree. Until statistical measures account for the student’s intentions for enrolling in a community college, measures of success for community college students are lacking (Adelman, 2005).

The Integrated Postsecondary Education Data System (IPEDS)

IPEDS is a system of interrelated surveys conducted annually by the U.S. Department of Education’s National Center for Education Statistics (NCES). IPEDS gathers information from every college, university, and technical institution that participates in the Federal student financial aid programs authorized by Title IV of the Higher Education Act of 1965, as amended. This statute requires institutions that participate in federal student aid programs to report to IPEDS data on enrollments, program completions, graduation rates, faculty and staff descriptive, finances, institutional prices, and student financial aid. The Department of Education added the graduation rate section to IPEDS to meet the requirements of the Student Right to Know Act (National Center for Education Statistics, 2010).

One of the strengths of the IPEDS system is its high participation and response rate. The 2008 enrollment component of IPEDS collected enrollment data for fall 2007. Of the 6,680 Title IV institutions in the United States and other jurisdictions, 6,669, or 99.8%, responded. An added benefit of the existing format of IPEDS is that the results are commonly available. Students, parents, and researchers are able to retrieve information from IPEDS directly from the Internet (Knapp, Kelly-Reid, & Ginder, 2009).

One of the major criticisms of IPEDS is its focus on a limited cohort. Former U.S. Secretary of Education Margaret Spelling stated, "...at the U.S. Department of Education, we can tell you almost anything you want to know about first-time, full-time, degree-seeking, non-transfer students. The trouble is that over half of today's college students are nontraditional students" (U.S. Department of Education, 2005, p. 10).

The IPEDS system does not collect data at the student level. IPEDS is only able to provide information at an aggregate or institutional level. Because IPEDS does not collect data on a granular or individual level, the system is not able to provide increased precision in estimates for trends happening across institutions, as well as developments within institutions. The current IPEDS framework consisting of aggregate data does not accurately capture changing enrollment and completions patterns in postsecondary education. This omission is costly, given the increasing numbers of nontraditional students and the mobility of students from institution to institution (Cunningham, Milam, & Statham, 2005).

IPEDS is also not able to produce a number of additional estimates that capture new dimensions of postsecondary education. IPEDS does not track students across institutions, produce unduplicated national headcounts, or adjust the college prices for various types of financial aid. Extensive government data on individual or subcohorts in higher education do exist, but they leave out large numbers of students and rarely focus on outcomes. However,

those data that exist are limited to full-time, first-time degree- or certificate-seeking students in a particular year. The U.S. Department of Education has information on race, ethnicity, and gender. However, no data exist on family income or on time to degree for individual students (Cunningham, Milam, & Statham, 2005).

In addition, IPEDS statistics do not capture transfer, part-time, and stop out students who graduate from somewhere other than the original institution. IPEDS misses an increasingly common enrollment cycle, students who begin their studies, drop out, and then restart. These shortcomings limit the utility of IPEDS data to provide the stakeholders of higher education an accurate picture of trends in higher education (Cunningham, Milam, & Statham, 2005).

Student Unit Record Data Systems

The U.S. Secretary of Education's Commission on the Future of Higher Education, also known as the Spellings Commission (U.S. Department of Education, 2006), recommended the expansion of IPEDS to maintain detailed student records for use in education research. However, concerns by privacy advocates and issues with the feasibility of such a system have made development of such a student-level database unlikely at the national level. However, many state governments have developed and are developing student unit record (SUR) systems and accountability programs to monitor student outcomes in their public colleges and universities (Ewell & Boeke, 2007).

The benefits of a properly operating national- or state-managed student records system include a set of common applications. These applications include the ability to generate data on graduation and retention, transfer and multiple enrollments, job placement and workforce development, high school feedback, developmental or remedial courses, and distance education. Additional applications include performance indicators, institutional profiles, and easy access for research. As of 2007, 40 states had 47 different SUR data systems, covering 81% of the nation's

total headcount enrollment and 77% of its full-time equivalent college students. There are issues that are typical among the states with these databases (Ewell & Boeke, 2007).

One issue involves seven states having separate databases for four-year and two-year schools. Few states have data for private institutions. Most systems are recent implementations and have limited value for historical data or longitudinal studies. Few systems collect data at the transcript level for students, but all existing systems contain the standard data required for IPEDS. For security reasons, the systems that require unique identifiers to match student records from term to term or college to college have a challenge because they are not allowed to use students' Social Security identifiers; even though all reports to the Internal Revenue Service regarding tuition data require Social Security identifiers (Ewell & Boeke, 2007).

The most significant issue when developing a comprehensive national student database is for the SUR to have ability to link to other databases. In 2007, 23 of the SUR databases link to state unemployment records. Eleven SUR systems link with high school databases. Nineteen SUR databases link to other databases such as military, driver's license, incarceration, and federal employment records. However, for the goal of creating a national database, all state SURs must have the ability to join to make one giant national SUR (Ewell & Boeke, 2007).

The ideal database is one where the public could view statistics and other information about colleges and universities to clarify the haziness of accountability. The key information that this proposed database would report includes the cost, price, admissions data, and completion rates for colleges. In time, the database would contain data such as the learning outcomes of students (Ewell & Boeke, 2007).

Ideally, a well run SUR will provide consumer-friendly comprehensive and individual core student data areas. This data includes including demographics, academic background, enrollment status, academic activity, and completion data on a detailed basic level. A well-

managed SUR will not aggregate institutional data the way IPEDS does. Currently, only 19 of the 47 SUR data systems report the core student data. In addition to most SUR systems not reporting data on all core student areas, other common problems exist with state-maintained SUR data systems. These problems include poor data quality, personnel shortages and turnover, inadequate staff to perform proper analysis of SUR data, and privacy issues (Ewell & Boeke, 2007).

Other College Data Systems

Four major publishers (*The College Board, Petersons, U.S. News and World Report, and Wintergreen/Orchard House*) collaborated to create the *Common Data Set (CDS)* initiative. The CDS is an effort to develop a set of standard data and data definitions for use in surveys that gather information for college guidebooks, rankings, and other resources for prospective students. It is important to note the CDS is a set of standards and definitions of data items rather than a survey instrument or set of data represented in a database (Seidman, 1996).

The CDS does not exist to collect specific measures the way IPEDS does. The CDS's popularity among institutions is that it supports the calculations and dissemination of specific institutional measures. The CDS is an important undertaking to improve the quality and consistency of data reported by colleges and to assist colleges and universities in the collection of data by using standardized survey questions. The goals of the CDS are to improve the quality and accuracy of information provided to all involved in a student's transition into higher education, to reduce the reporting burden on data providers, and to improve the consistency of information collected. This higher quality information will allow potential students to make comparisons among schools that are more accurate (Seidman, 1996).

The *Common Data Set* includes sections on institutional characteristics, enrollment, persistence, graduation rates, retention rates, freshman admission requirements and academic

profile, transfer admission requirements, academic offerings, library collections, student life, annual expenses, and financial aid (Georgia Southern University, 2010). The Common Data Set Initiative explains, “...each of the higher education surveys conducted by the participating publishers incorporates items from the CDS as well as unique items proprietary to each publisher. Consequently, the publishers’ surveys differ in that they utilize varying numbers of items from the CDS” (2010, p. 1).

Hagedorn (2005) explains the CDS aids research in higher education with the development of standardized data items and definitions in order to develop consistent data reporting. The CDS focuses on the data items and definitions used by the U.S. Department of Education in its higher education surveys. Additional elements in the Common Data Set items undergo review by the CDS Advisory Board as well as by data providers representing secondary schools and two- and four-year colleges. The Common Data Set has approximately 120 definitions that cover terms from *tuition* to *Carnegie units*. Over time, the initiative adds, edits, drops, or clarifies the meaning of terms. A result of the CDS’s consistent measurement standards, the concept of persistence has developed. Now, IPEDS reports *persistence* the same for both four-year and less than four-year institutions. This consistency serves to promote comparability in data reporting.

The National Student Clearinghouse (The Clearinghouse) is a nonprofit organization established in 1993 to verify degrees and standardize student loan status has developed another data system. The Clearinghouse is currently the only nationwide database compiling detailed student information. Specifically, The Clearinghouse is a student data repository that hosts information for 91% of all college students, more than 3,000 plus institutions, and more than 100 million current and former students. The service boasts that it utilizes actual enrollment data, not surveys (National Student Clearinghouse, 2009).

The Clearinghouse also offers a research service that provides continuous enrollment and degree information about prospective, current, and former students. The service can provide enrollment information on graduates or those who left before graduation. This service has the ability to follow students enrolled simultaneously in more than one college or “swirling.” This system can track students who transfer and students who stop out (Hagedorn, 2005).

In addition to degree verification, The Clearinghouse clients use its services to provide enrollment verification, electronic transcripts, and good student information to insurance companies. While researchers and others frequently use The Clearinghouse data for system persistence measures, The Clearinghouse cautions the service did not create the system as repository for research data and not all institutions participate in The Clearinghouse (National Student Clearinghouse, 2009).

Private foundations are also sponsoring a number of efforts aimed at developing better ways of collecting data for measuring and monitoring student success. As Moore and Shulock report:

The Cross-State Data Work Group, a collaboration of seven states participating in the Lumina Foundation’s Achieving the Dream initiative, recently developed some measures of student outcomes in community colleges and tested them with data from several states. Funding through both the Achieving the Dream initiative and the Ford Foundation’s Bridges to Opportunity project was used by the Community College Research Center to develop a set of student success measures for community colleges (2009, p. 1).

Theories of Student Retention

This portion of literature review focuses on the theories and theorist of retention and follows the framework used by Randy McClanahan in his report for ACT, “What Works in Student Retention? Review of Retention Literature” (2004). This review will follow the order of McClanahan’s narrative including his discussion of the works of Durkhiem, Spady, Tinto, Bean, Astin, and Pascarella.

Emile Durkheim's study of suicide is the basis for most of the notable early models in retention. In his classic work *Suicide*, Durkheim, a French sociologist, sought to explain the reasons different societies experienced differential rates of suicides, and why the rates in some societies varied over time. His analysis of the underlying causes of suicide led him to create a four-category classification system for suicide of altruistic, anomic, fatalistic, and egotistical (Dohrenwend, 1959).

An altruistic suicide is one that a society would consider appropriate morally. An example of altruistic is a soldier who dives on top of a hand grenade in order to save the lives of his fellow soldiers. Anomic suicide refers to a situation in which the norms of society have broken down and society no longer controls behavior. Anomic suicide is most likely to befall individuals who cannot adapt to the loss of the societal norms. Anomic suicides often occur when an economic downturn takes place and impacted individuals choose suicide over living in diminished economic conditions. Fatalistic suicide is at the other end of the spectrum of normative control. Whereas an anomic suicide occurs in situations having too little normative and societal control, a situation that creates too much control characterizes the fatalistic suicide. A fatalistic suicide may appear to be the only solution to individuals who find their future and passions hopelessly blocked by oppressive regulation. Fatalistic suicide is common for prisoners or the elderly placed in nursing homes. The fourth form of suicide in Durkheim's theory is egotistical suicide. Egotistical suicides occur because of an individual's failure to integrate within the communities of society. Failure to integrate may be the result of the individual holding deviate values that are not commensurate with the dominant values of society. The failure to integrate may simply be the lack of affiliation that leads to or causes social isolation. Sociologists attribute the fact that unmarried males commit suicide more often than married

males to their lack of social integration and thus classify this behavior as egotistical suicide (Dohrenwend, 1959).

William G. Spady (1970), an American sociologist, was the first to propose a widely recognized model for college student dropouts (see Figure 1). He saw how Durkheim's study of suicide could relate to the departure of students from college. Spady, consistent with Durkheim's theory, suspected that students who do not share the principles and beliefs of their peers or of the college itself would not persist in college. He analogized the process of departing college to engaging in suicide-like behaviors by dropping out of college or by removing themselves from the college's society. Conversely, if a student's beliefs and values were congruent with those of other students or with the college, they were more likely to persist. He used Durkheim's suicide theory to develop a model of the dropout process. Starting with a base of family background, he proposed five variables: academic performance, normative congruence, grade performance, intellectual development, and friendship support that produced social integration. Spady defined normative congruence as "... having attitudes, interests, and personality dispositions that were basically compatible with the attributes and influences of the environment" (p. 65). He also explained that friendship support was a network that allowed students to become part of the social system of the university.

Spady (1971) then linked these five variables indirectly to the dependent variable, dropout decision, through two intervening variables of satisfaction and institutional commitment. He later designed and executed an empirical study of his model. In applying his model to 683 first-year students at the University of Chicago in 1965, Spady found that grade performance was the primary determinant of dropouts for men and general commitment to the institution was the primary determinant of dropouts for women. Overall, he argued that family experiences and normative orientations (i.e., the extent to which a student's disposition is in line with the

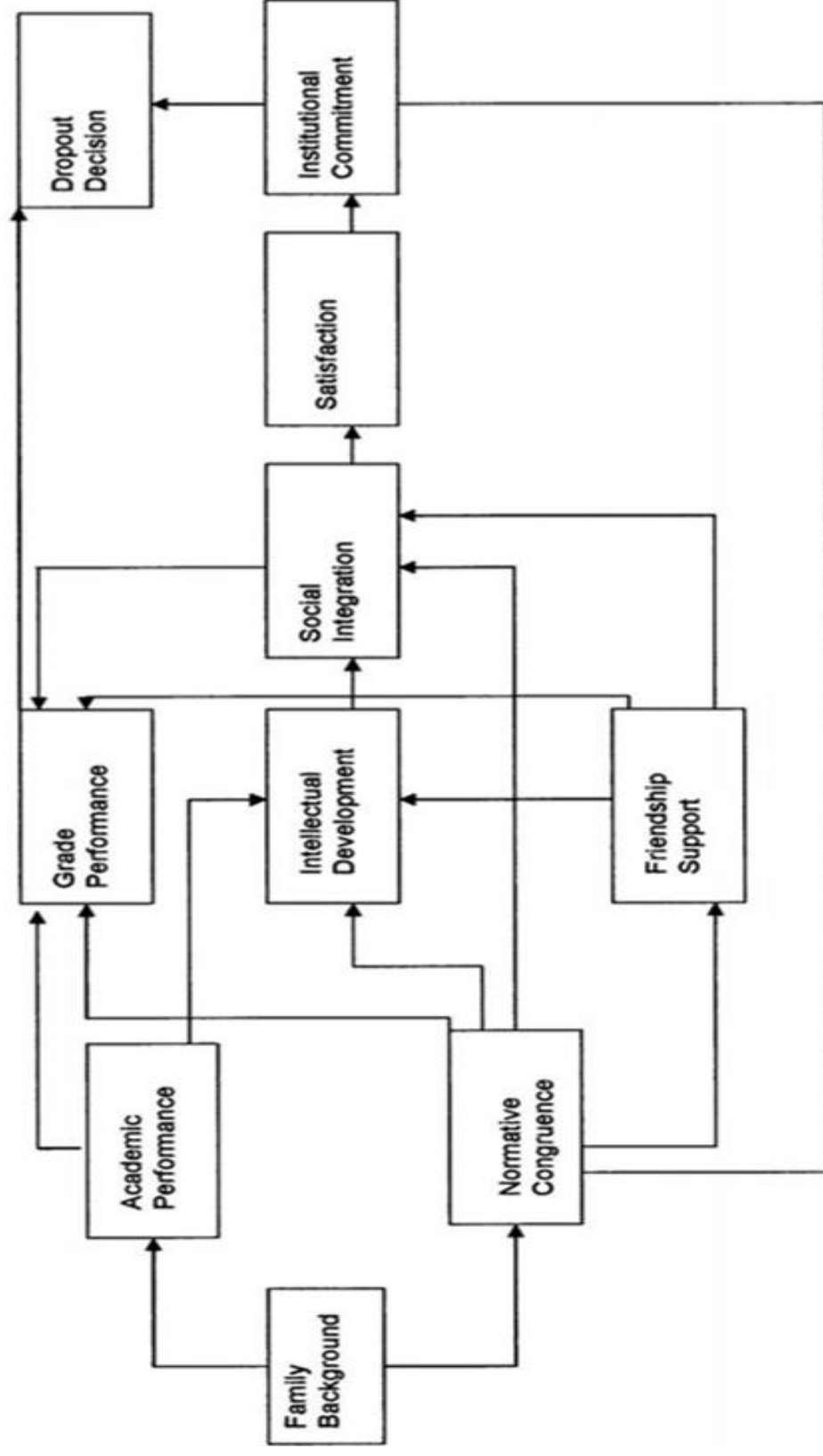


Figure 1. The Spady College Students Dropout Model (Spady, 1971)

institution's expectations), also play a direct role in the dropout process. Spady concluded, "It is clear from our findings that the intrinsically rewarding aspects of these activities, plus the establishment of personal contacts with faculty as well as peers, are fundamental components of student integration, satisfaction, and commitment" (p. 62). The results of the empirical study indicated that, "over a four-year period...formal academic performance is clearly the dominant factor in accounting for attrition among both sexes" (p. 38).

Vincent Tinto, a professor of education at Syracuse University, developed the student integration model (1987), which was the next widely recognized work in attrition. Tinto's book *Leaving College: Rethinking the Causes and Cures of Student Attrition*, is highly respected among researchers of college retention, as indicated by a Google Scholar search showing the book has over 3,200 citations. Tinto, like Spady, linked his multivariate retention model to Durkheim's suicide model.

Tinto (1987) identified eight major reasons for a student to leave college. The identified causes were intentions, commitment, adjustment, academic difficulty, congruence, individual isolation, obligations, and personal finances. He divided these into pre-entry factors (intentions and commitments), and after-college factors (adjustment, academic difficulty, congruence, and isolation). After identifying the eight reasons, Tinto formulated his interaction model of attrition. Tinto's model states that student retention is a longitudinal process or a process occurring repeatedly until a student reaches a final decision about remaining in college. Tinto's model focuses on both the formal and informal dimension of a given college or university. His theoretical model has five levels and starts with a first level of pre-entry college attributes such as family background, skill, ability, and prior schooling that form individual goals and

commitments. He further incorporates a second level of his model, goals and commitments that interact with the third level, institutional experiences. Finally, the fourth level of his model, integration, leads to the fifth level, a reassessment of goals and commitments, and results in the ultimate outcome — the student's decision to persist or leave college (1987).

As described in Figure 2, pre-entry attributes consist of family background, skills and abilities, and prior schooling. Family background includes socioeconomic status, parents' education level, and parents' expectation of the student. Income levels and educational attainment of family members can measure *family background*. *Skills and abilities* are student's natural inclination to succeed in college. The SAT, ACT, and other entrance tests can measure a student's *skills and abilities*. Prior schooling is a student's pre-college schooling experiences including secondary school and record of high school achievement. High school transcripts are one measure of a student's prior schooling (Tinto, 1993).

Goals and commitments of a student consist of intentions, goals and institutional commitments, and external commitments. Braxton, Hirschy, and McClendon (2004, p. 8) state that the “. . . initial commitments to the institution and initial commitment to the goal of graduation influence the level of a student's integration into the academic and social systems of the college or university.”

The third level of the model is the institutional experiences of a student. The two elements that make up this level are the academic system and social systems of a college. Each one of these elements has a formal and informal component. The formal component of the academic system is academic performance. A student's GPA evaluates this measure. Faculty and staff interaction is an example of the informal component of the academic system (Tinto, 1993).

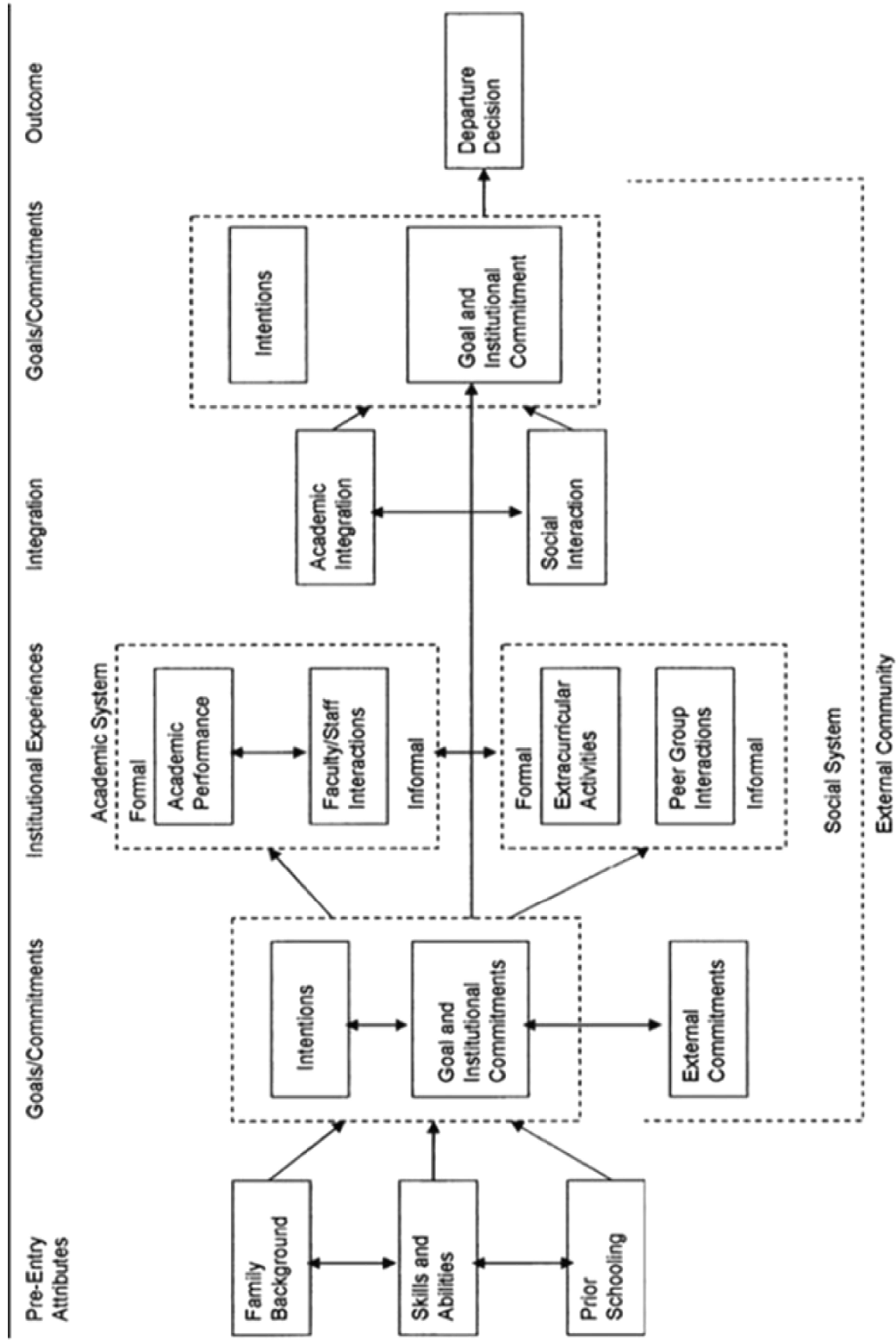


Figure 2. Tinto's Longitudinal Model of Institutional Departure (Tinto, 1993 p.114)

The social system of the institutional experience includes formal and informal components. An example of the formal component is institution-sponsored extracurricular activities, such as intercollegiate athletics or intramural sports. The informal components include peer group interactions, such as friends from home or roommates (Tinto, 1993).

The fourth level is the second integration between the student and the institution. This integration occurs after a student has progressed through the institutional experience and is affected heavily by all three of the previous levels. Tinto's theory emphasizes the importance of academic and social integration. According to Tinto, the impact of these two systems is not entirely balanced. Some colleges stress intellectual pursuits, while other institutions are successful at the social integration of students (Tinto, 1993).

Structural and normative components define academic integration. In his model, Tinto stated that *structural* integration involved the student following stated norms of the institution, whereas *normative* integration pertained to an individual's identification with the structure of the hierarchy of individuals involved in the academic system (Tinto, 1975). As Wildman (2009, p. 20) states the concept, "...can a student make the grades? Can he handle the academic rigor? Does the student feel like the curriculum is a fit for her?"

A student's ability to fit into the social structure of a university, and therefore socially integrate, can be through formal or informal means. The student may participate in university-sponsored extracurricular activities, like a social group or service project. The student may join a student interest group. The student may visit and develop friendships with instructors, employees, or other students of the institution. Sometimes a student does not want to or cannot interact with school outside of attending class (Tinto, 1975). The nontraditional working student who lives off campus will have difficulty or little incentive to integrate socially with an

institution. Tinto states that students who do not socially integrate with an institution will integrate at different levels. The student's social and academic integration is a significant factor as to whether or not the student is committed to his career and educational goals, as well as to the goals of the institution.

In summary, Tinto states the academic and social integration into the formal and informal academic and social systems of an institution determines an individual's departure decision. Stated differently, a driven, academically prepared student who comes from a family that values higher education and attends an institution where she or he fits in socially and academically has a higher chance of completing college than one who does not.

Alexander Astin, a prominent professor of higher education at UCLA, and the brother of the star of the 1960s television show, *The Addams Family*, John Astin, created the Theory of Student Involvement to explain student retention. The theory's goal is "to identify factors in the college environment that significantly affect the student's persistence in college" (Astin, 1984, p. 302). Based on his longitudinal study published in 1975, Astin, unlike Tinto, believed on-campus factors explained almost all the elements involved in student retention. He discounted Tinto's focus on pre-entry aspects required for college success. He saw student involvement as the key element to student persistence in college.

Astin stated that the three most important factors for college retention were for students to have academic, faculty, and peer group involvement. He stated that the key for academic involvement was for faculty to have a pedagogical or teaching approach that encouraged, if not demanded, student participation and involvement. Faculty interaction, both inside and outside the classroom, helps increase student involvement. Memberships in formal and informal groups cultivate peer group involvement (Astin, 1984).

Astin specifically suggested that smaller institution size, fewer hours working off campus, and living on campus, increase student involvement, which in turn increases retention. He specifically recommended making the financial aid process easier for students, increasing student participation in work-study programs, and focusing on recruiting students whose personal goals match the institution's mission with regard to increasing student involvement (Astin, 1984).

One of Astin's (1993) main points with his theory of student involvement is that a college has a huge influence over its own retention success. Institutions need not look far afield to find the key to enhanced student retention. It is achievable within the confines of existing institutional resources. It springs from the ongoing commitment of an institution, of its faculty and staff, to educate.

However, such commitment requires institutional change. It requires that institutions rethink traditional ways of structuring collegiate learning environments and find new ways of actively involving students, as well as faculty, in their intellectual life. It requires a deeper understanding of the importance of the educational community to the goals of higher education (Astin, 1993).

John Bean (1990), a faculty member at Indiana University, developed the Model of Student Departure based on student satisfaction. Bean felt that the processes a student undertook when making the decision to leave college were more similar to the processes involved in deciding to quit a job than processes one uses in making the decision to commit suicide. Bean felt that models based on Durkheim's Suicide Model omitted two key factors for student departure: environment influences and a student's intentions.

Environmental influences include factors outside the college that might affect retention. Specific examples of environmental influences are employment issues or financial pressures.

Student intentions, a factor research indicate is the best predictor of student retention consists of students meeting their personal goals and leaving college before graduation. An instance of where student intentions will cause a student to leave school is when a student enters college with the intention of upgrading his professional skills and plans to take three accounting courses. Once the student completes the courses, he will likely leave school (Bean, 1990).

A test of Bean's model (Bean, 1980) indicated that institutional quality and opportunity for men were the two most important variables influencing commitment. For women, institutional quality, opportunity, and satisfaction were the most important. In general, men left the university even though they were satisfied; women who were satisfied were more committed to the institution and were less likely to leave.

Bean (1985) revised his model and reported that, first, student peers are more important agents of socialization than informal faculty contact; second, students play an active role in their socialization in school; and third, college grades seem more the product of how students and colleges select each other than how well a student adapts socially.

Bean (1983) later reduced his 1980 model of student attrition that consisted of more than 20 independent variables to 10 independent variables. He divided his sample into high confidence and low confidence men and women. The 10 independent variables were intent to leave, practical value, certainty of choice, loyalty, grades, courses, educational goals, major and job certainty, opportunity to transfer, and family approval of the institution. His research found that four of the 10 variables significantly affected dropout; they were as follows in order of significance: intent to leave, grades, opportunity to transfer, and loyalty.

Bean's theories added the elements of environmental influences and student intentions to Tinto's theories. Bean's focus on issues after a student matriculates to college is more useful to open admission colleges.

Ernest Pascarella, a professor of higher education at the University of Iowa, developed the Conceptual Model for Research on Student Faculty Informal Contact. Like Tinto, Pascarella's model (1980) was longitudinal, or tracked a cohort of students over time, and viewed informal interaction between students and faculty as key to student persistence. He advocated that along with informal contact, four other sets of variables for retention influenced student retention. Those variables are student background characteristics; institutional factors; other college experiences; and educational outcomes. Pascarella felt that if the attributes of these four variables did not promote informal contact between students and faculty, a student is less likely to persist.

The four variables of Pascarella's (1980) model included *student background characteristics* that includes family background; aptitudes; aspirations; personality orientations, goals, values, and interests; secondary school experiences; expectations of college; and openness to change. The elements for *institutional factors* involved faculty culture, admission and academic standards, institutional size and image, and organizational structure and policies. *Other college experiences* include residential facilities, peer culture, extracurricular and leisure activities, and classroom experiences. Finally, the last variable, *educational outcome*, has the elements of academic performance, intellectual and personal development, career aspirations, college satisfaction, and institutional integration.

Pascarella (1985) later found that all other variables in the model indirectly affect learning and cognitive development. Findings from the 1985 study indicated that residential facilities and

the dominant peer group were strong influences on academic achievement. The results supported the notion that student/faculty interaction outside of the classroom was important, just not as important as the Student Faculty Informal Contact model indicated.

Predictors of Retention

The Community College Survey of Student Engagement (Community College Leadership Program University of Texas, Austin, 2005) identified risk factors that reduce student persistence and graduation rates. The factors listed include poor academic preparation for college-level work, not entering college directly after high school, and attending college part-time. Additional factors include single parenthood, financial independence (i.e., students who rely on their own income or savings and whose parents are not sources of income for meeting college costs), caring for children at home, working more than 30 hours per week, and first-generation as a college student.

Research has identified several predictors of university retention. Noted predictors include high ACT or SAT scores in math, attending an institution with selective admissions requirements, attending an institution that has significant spending on research, starting college immediately after graduating from high school, and enrolling as a traditional student. Community college students, almost by definition, do not meet these factors. These predictors of university retention simply do not apply to community colleges. For standardized tests, the community college 75th percentile mathematics score for the SAT of 529 equals the 55th percentile for the general population on the SAT (Snyder & Dillow, 2010). By definition, community colleges are open admissions and not selective advancement (American Association of Community Colleges, 2010). Community colleges do not have a research mission. Community colleges as a whole spend less than 1% or \$18 million of their aggregate budget on

research (Knapp, Kelly-Reid, & Ginder, 2009). By comparison, in 2008, Texas A&M, the twentieth largest university in the United States in research expenditures, spent \$544 million and outspent the aggregate spending of all community colleges by \$526 million (Britt, 2009). In addition, U.S. Department of Education research indicates 59% of community college students delayed enrollment and 90% of community college students are nontraditional (National Center for Education Statistics, 2002).

Other retention methods include Moore and Shulock's (2009) recommendation to establish milestones to increase community college graduation. These milestones focus on retention, remediation, and credit accumulation plus academic behaviors. Suggested milestones include starting and completing remedial classes as soon as a student starts college, earning 30 hours of college credits, enrolling full-time, and enrolling continuously without "stop outs."

The University of Florida implemented the Universal Tracking System. This system monitors the progress of all undergraduate majors toward graduation. The university designed this system to assist students in finding the best path toward completion of their degree, to advise them to the most appropriate major, and to provide feedback on their academic progress. In short, its goal is to help students graduate with the smallest number of excess hours possible and to increase retention (Craig, 1998).

After implementing the Universal Tracking System, the University of Florida had a reduction of excess hours, or credits students earned but did not apply toward a degree. This system decreased the number of students who changed majors by 20%. Because of the tracking system, the university experienced improvement in academic performance and student retention (Craig, 1998).

The Independent Variables

This study has two sets of independent variables, functional expenditures per full-time student, and a second set of descriptive independent variables. The first set of variables,

functional classification of expenditures, is a method of grouping expenses according to the purpose for which the institution incurred the cost. Public institutions are required to report expenditures by function. The National Association of College and University Business Officers set the parameters and definitions of functional expenses (National Association of College and University Business Officers, 2010). Those definitions are as follows:

- **Education and General (E&G) expenditures**—Costs incurred for goods or services used to provide instruction, public service, academic support, student services, institutional support, operation and maintenance of plant, and scholarships and services (National Center for Educational Statistics, 2010, p. 21).
- **Instruction**—The instruction category includes academic instruction, occupational and vocational instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction conducted by the teaching faculty for the institution's students. Excluded are expenses for academic administration where the primary function is administration (e.g., academic deans) (National Center for Educational Statistics, 2010, p. 38).
- **Academic support**—includes expenses of activities and services that support the institution's primary missions of instruction, research, and public service. It includes the retention, preservation, and display of educational materials; organized activities that provide support services to the academic functions of the institution media such as audiovisual services; academic administration and formally organized and separately budgeted academic personnel development and course; and curriculum development expenses (National Center for Educational Statistics, 2010, p. 2).

- **Student services**—Reports expenses for admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program. Examples are career guidance, counseling, and financial aid administration. This category also includes intercollegiate athletics and student health services, except when operated as self-supporting auxiliary enterprises (National Center for Educational Statistics, 2010, p. 67).
- **Institutional support**—Reports expenses for the day-to-day operational support of the institution, excluding expenses for physical plant operations. Also includes expenses for general administrative services, executive direction, and planning, legal, and fiscal operations, and public relations/development (National Center for Educational Statistics, 2010, p. 38).
- **Other core expenses**—Reports the sum of expenses for the following functions: operation maintenance of plant, depreciation, scholarships and fellowships expenses, other expenses and deductions, total non-operating expenses and deductions (National Center for Educational Statistics, 2010, p. 48).

The secondary independent variables for this study describe characteristics of the population of students enrolled in an institution. These variables include the number of full-time and part-time students enrolled in the institution, the average age of students, percentage of female students, percentage of minority students, percentage of students on financial aid, percentage of students with Pell Grant awards, percentage of students with federal loans, and the number of students attending part-time (National Center for Education Statistics, 2009).

For community colleges, the average number of students enrolled in an institution is 5,933 (Provasnik & Planty, 2008). Institutional size has a negative relationship with graduation rates (Bailey, Calcagno, Jenkins, & Leinbach, 2006). The average age of a community college student is 29 years old (American Association of Community Colleges, 2010) and there is a negative relationship between age and retention rate (Horn, 2009). Fifty-seven percent of community college students are female and “the female student has a higher probability of persistence than does the male students” (Chen & Thomas, 2001, p. 49). The racial breakdown of community college students is 61% white, 14% black, and 16% Hispanic (American Association of Community Colleges, 2010). Horn found for community colleges overall, the odds of retaining black students was significantly lower than for white students. Bailey *et al.* found that colleges with a high combination “of minority students, part-time students, and women have lower graduation rates” (Bailey, Calcagno, Jenkins, & Leinbach, 2006, p. 491).

“Sixty-six percent of all undergraduates received some type of financial aid. For those who received any aid, the total average amount received was \$9,100. Fifty-two percent received grants averaging \$4,900, and 38% took out an average of \$7,100 in student loans” (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009, p. 3). Fifty-five percent of community college students who receive financial aid persist, which is greater than non-recipients and about even when controlling for academic ability. Gift aid in the form of scholarships and grants and work-study, as contrasted with loans, is associated with higher retention and graduation rates (The Pell Institute, 2004).

Approximately 21% of community college students received Pell Grants (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009). “Receiving a Pell Grant in the first year of enrollment was not significantly associated with three-year institutional retention rates. However, first-year Pell

Grant recipients exhibited lower odds of leaving in the first year” (Horn, 2009, p. 43).

“Providing an African American or Hispanic student with an additional \$1,000 in grant funds decreased the probability of dropping out by 7 percent and 8 percent respectively.”

Approximately 10% of community college students receive federal loans (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009). “Loans seem to be helpful in encouraging white students to persist but do not positively affect completion rates for African American and Latino students” (Kuh, Kinzi, Buckley, Bridges, & Hayek, 2006, p. 102).

Part-time students make up 59% of the enrollment in community colleges (American Association of Community Colleges, 2010). Part-time student retention rates are lower than full-time retention rates. Bailey states that in community colleges, female part-time retention is significantly lower than male part-time retention. Once gender is controlled, part-time retention rates equal full-time retention rates (Bailey, Calcagno, Jenkins, & Leinbach, 2006).

Finance and Educational Outcomes

The study of relationships between financial spending and educational outcomes began in primary and secondary education with one of the largest studies ever commissioned, the *Coleman Report* in the 1960s. This report used data from more than 600,000 elementary and secondary students and teachers from across the United States. The researchers found that academic achievement was less related to the financial quality of a student's school and more related to the social composition of the school. This report was the major research given as scientific support for the policy of forced busing in the 1960s and 1970s (Kiviat, 2000). Another large study, the Tennessee STAR Project, found for minority students, expenditures per student and lower class sizes had a positive relationship for increasing students' test score gains and

graduation rates (Schanzenbach, 2006). There is an extensive body of research on the relationship between spending inputs and educational output for primary and secondary education (Webber & Ehrenberg, 2009).

A search of relevant literature on the relationship between functional expense allocation and retention reveals seven notable studies. Thomas & Bean (1988) studied 118 liberal arts colleges. Using the theories of Tinto, Astin, Bean, and Pascarella as a basis, they stated that institutional financial viability of a college, as measured by educational and general expenditures, was clearly the most important determinant of retention of the variables in their study.

Astin (1993) devotes less than two pages to the issue of institutional expenditures. His research on four-year colleges found that expenditures dedicated to student services and instruction had a direct positive effect on student satisfaction and a positive indirect effect on degree completion, but that “...investment in student services is a more critical environmental factor than the investment in instruction” (p. 331).

Wyman (1997) studied retention data at 16 community colleges in South Carolina. Using Astin and Tinto to develop his theoretical base, he found that colleges must increase per-student spending on instruction and academic support at a faster rate than the growth of area mean income if they desired to increase retention rate.

Kim, Rhoades, & Woodard (2003), in their study of graduation rates at 142 public research universities, showed there is a positive linear relationship between sponsored research expenditures and student graduation. The authors noted that their results were consistent with the theories of Tinto, Astin, Bean, and Pascarella. While research is not part of the community

college mission, this study is part of the body of research on the relationship between expenditures and retention until graduation.

Ryan (2004), in his study of 363 Carnegie I and II institutions, used Tinto's academic and social integration theories, Pascarella's student interactions, Astin's theory on student involvement, and Bean's student satisfaction theories as the theoretical basis for his study. He found that instructional and academic support spending produces positive and significant effects on graduation rates. He found that student services and institutional support spending have no effect, positive or negative, on graduation rates.

Titus' (2006) study with student-level data used longitudinal data on 769,990 students at baccalaureate universities. He used Bean's student attrition model, Pascarella's framework, and Astin's student involvement model for his theoretical framework. Titus found that spending on institutional support is negatively related to persistence rates and spending on instruction.

Gansmeyer-Topf and Schul (2006) studied data from 466 private baccalaureate liberal and general colleges and universities and found that persistence rates were positively related to academic support services, but negatively related to student service expenditures. The authors stated that these results supported Tinto's (1993) interactionalist theory of academic departure and Astin's (1984) theory of involvement.

Gansmeyer-Topf and Schul (2006) tie spending by functional expenditures to retention theories. Gansmeyer-Topf and Schul assume that as institutions increase allocations of resources to the functional expense area of instruction, they are supporting the ability of students to connect with faculty and other students. This result is consistent with Astin's theory of involvement and Tinto's interactionalist retention theories. Tinto's (1993) interactionalist theory of academic departure purports there is a positive relationship between increased student

academic and social engagement in college and persistence. Astin's (1984) theory of involvement proposed that as students become more involved in their course work or extracurricular activities, they are more likely to persist.

Gansmeyer-Topf and Schul (2006) also assume that academic advising provides students with an opportunity to engage academically. Gansmeyer-Topf and Schul argue that since academic advising expenses relate to academic support expenditures, then they are positively related to retention and graduation rates.

Gansmeyer-Topf and Schul (2006) further assume that the role of student services professionals is to complement students' in-class educational experiences by getting students involved in their institution through a variety of experiences (e.g., residence halls, student activities, and recreation). As students connect to their institution, involvement with the institution increases, thus increasing their chances of persistence. The authors also found that as selectivity of the institutional student body increases, regression models using financial independent variables also increased in quality.

Theoretical Framework

This study will follow the same theoretical framework Ryan (2004) used in his study on expenditures by function and retention. In his framework, Ryan used the theories of Tinto (1993), Pacarella (1980), Astin (1993), and Bean (1980). The focus of these theories is on post-matriculation, or after enrollment, factors that increase student retention. These theories consist of academic and social integration (Tinto), student interactions with faculty (Pascarella), student involvement (Astin), and student satisfaction (Bean). Ryan added to these theories by tying each one to a functional expense.

Conceptually Ryan ties Tinto's emphasis on academic and social integration to the functional areas of academic support and instructional spending. Pascarella's notion that student interactions with faculty increase retention ties with instructional spending. Astin's theory of student involvement is associated with instructional and student services spending. Bean's emphasis on student satisfaction relates closely to instruction, academic support, and student services spending. Ryan adds to this relationship by postulating that, while necessary, spending on institutional support reduces spending on instruction and excess spending on institutional support limits spending in areas presumed to increase retention.

Gansmeyer-Topf and Schul (2006) followed Ryan's framework in tying retention theorist and theories to functional expenditures. Both Gansmeyer-Topf and Ryan's studies focused on four-year colleges. No literature was uncovered where this framework was used to study community colleges. Figure 3 summarizes the relationships between functional spending and student retention in community colleges that was used as the foundation for this study.

Summary

A small body of literature exists about higher education using institutional-level data to study the impact of higher education expenditures on persistence and graduation rates. Webber and Ehrenberg (2009) state, "...with few exceptions, expenditures per student have not been disaggregated into different functional categories of expenditures in this research" (p. 3). Few studies separate out "...expenditures into functional categories such as instruction, student services, academic support, and research" (p. 3). Those studies "...have not reached a consensus on whether expenditure categories other than instruction influence persistence and graduation rates" (p. 3).

Based on this review of literature, only one study exists that attempts to understand the relationship between expenditure allocation by function and first-year retention rates for

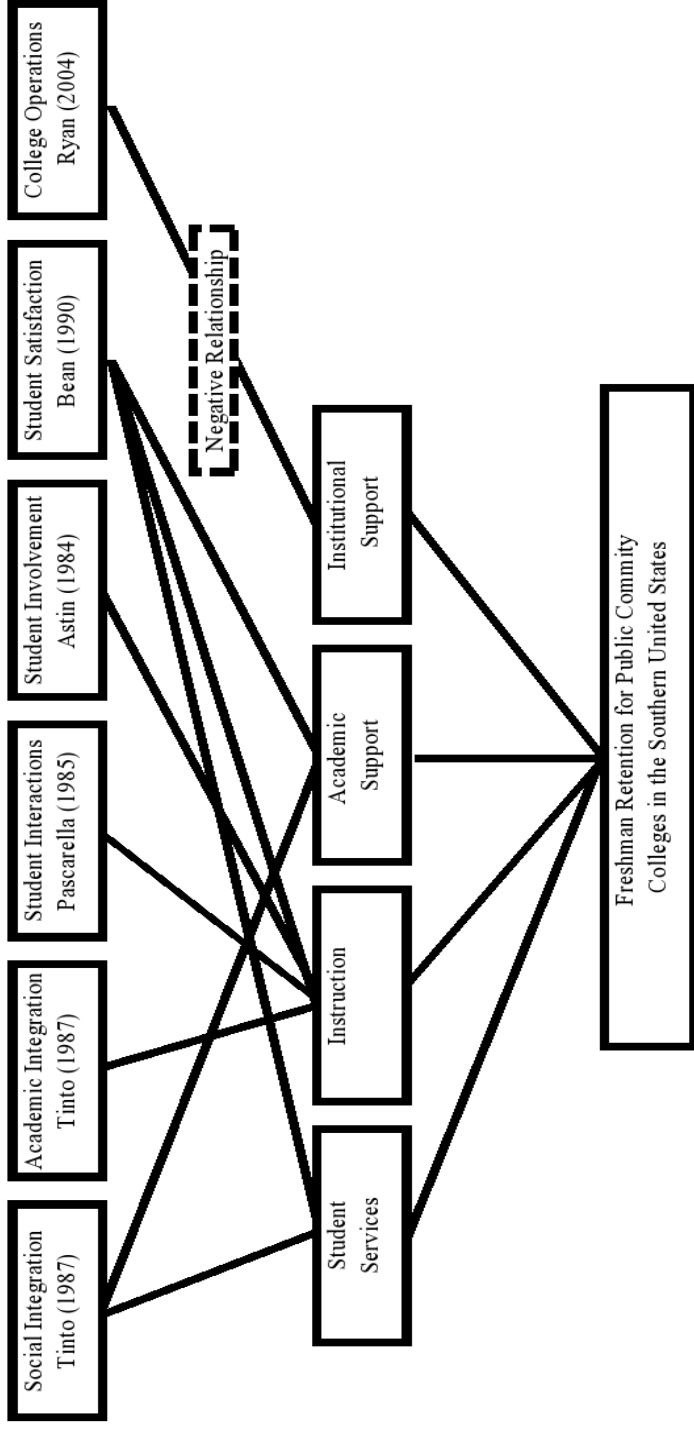


Figure 3. Summary of Retention Theories Explanation of Variables Related to Functional Spending.

community colleges (Wyman, 1997). This study, based on 15-year-old data, and its population was only 16 colleges in one state.

There is a gap in the literature. Filling this gap requires additional study to understand the relationship between expenditure allocation by function and first-year retention rates for community colleges. This study hopes to determine what optimal allocation of spending expense function will maximize student retention.

CHAPTER 3: METHODOLOGY

Population

This study's population includes all regionally accredited public community colleges located in the 16 Southern Region Education Board (SREB) states with information reported to the Integrated Postsecondary Education Data System (IPEDS) database ($N = 402$). This is a census study; therefore, data from all institutions in the target population are included. The Higher Education Act of 1992 requires completion of the IPEDS. This law specifically requires all institutions taking part in any federal student financial aid assistance program authorized by Title IV of the Higher Education Act of 1965 to complete the survey. The U.S. Department of Education requires completion of the IPEDS survey in an accurate, timely manner in order to continuing offering federal financial aid (National Center for Education Statistics, 2010).

Data Collection

This study utilized information from the IPEDS Data Center. The U.S. Department of Education's National Center for Educational Statistics (NCES) maintains this database. IPEDS collects various financial and descriptive data from all colleges participating in federal financial aid programs. For the purpose of this study, there are three major groups of variables. The first variable is the dependent variable of freshman retention. This study defines freshman retention as the fall-to-fall retention rates for full-time first-time students. The second group of variables consists of the primary independent variables of expenditures by function as a percentage of total expenditures. The third group includes secondary independent variables that report additional characteristics describing institutional student population by age, race, gender, financial aid, and enrollment data.

The NCES publishes IPEDS survey data on an annual basis, but each survey differs in how it collects and reports data (Knapp, Kelly-Reid, & Ginder, 2009). Using the IPEDS Datacenter,

this study queried data from all public community colleges in the 16 SREB states (National Center for Education Statistics, 2010). The query collected the spending allocation by function classification as a percentage of total expenditures. The five specific financial independent variables and the dependent variable retrieved were as follows:

- Instructional expenses as a percent of total core expenses
- Academic support expenses as a percent of total core expenses
- Student service expenses as a percent of total core expenses
- Institutional support expenses as a percent of total core expenses
- Other core expenses as a percent of total core expenses, and
- The dependent variable of fall-to-fall full-time retention rate

This query also collected additional data on selected institutional descriptors. Those 16 descriptive variables were:

- The number of students enrolled in the institution
- The number of students enrolled part-time in the institution
- The percent of total enrollment who are white non-Hispanic
- The percent of total enrollment who are black non-Hispanic
- The percent of total enrollment who are Hispanic
- The percent of total enrollment who are women
- The percent of undergraduate enrollment under age 18
- The percent of undergraduate enrollment age 18 to 24
- The percent of undergraduate enrollment age 25 to 64
- The percent of undergraduate enrollment over age 65
- The total amount spent on core expenses

- The percentage of students receiving federal grant aid
- The percentage of students receiving Pell Grants
- The percentage of students receiving federal loan aid
- The number of full-time equivalent students
- The amount of core expenses per full-time equivalent student

The data from this query were downloaded into a Microsoft Excel spreadsheet. The data from the spreadsheet was then uploaded to The Statistical Package for the Social Sciences (SPSS) for additional analysis.

Data Analysis

Objectives One, Two, Four, and Five

Descriptive statistics (N , M , SD) were used to describe the data collected for all variables (five classifications of allocation of financial resources by function) for objective one and (16 institutional characteristics) objective four. These results reported data unweighted by institutional population descriptors. For objectives two and five, Pearson (r) correlations were used to describe the relationships between five classifications of allocation of financial resources by function, the 16 institutional characteristics, and freshman retention. The effect size interpretation for the correlation coefficients reported objectives two and five are listed in Table 1.

Objectives Three and Six

For objective three, forward regression analysis was used to determine if a model exists that explains an important proportion of the variance in first-year retention rates. The potential explanatory variables were the allocation of financial resources by function.

Table 1. Hinkle, Wiersma, & Jurs (2003) Descriptors for Interpreting the Effect Size for the Correlation Coefficient

<i>r</i>	Effect size interpretation
±.90 to 1.00	Very high correlation
±.70 to .90	High correlation
±.50 to .70	Moderate correlation
±.30 to .50	Low correlation
±.00 to .30	Little, if any correlation

For objective six, forward regression was used to determine if a model exists that explains an important proportion of the variance in first-year retention rates, after controlling for the institutional characteristics listed in objective four. Again, the potential explanatory variables were percent allocation of total expenditures to the five functional classifications and the 16 institutional characteristics describing institutional student population by age, race, gender, financial aid, and enrollment data. The main purpose of the analysis in objective six, as opposed to the analysis for objective three, was to determine if controlling the institutional variables would produce a regression model that improves the variance of the model produced in objective three.

After deleting all non-regionally accredited institutions and prior to performing multiple regression techniques, the data set was analyzed to ensure it met the three general assumptions of multiple regression: (a) normality, (b) linearity, and (c) homoscedasticity (Mertler & Vannatta, 2005). Institutions that did not provide complete data for the research question were omitted. Data were also evaluated for univariate or multivariate outliers (Mertler & Vannatta, 2005). It is important to scan for univariate outliers since a few institutions with extreme data can significantly distort research findings (Mendenhall & Sincich, 1996). Data were transformed into z-scores. Any z value greater than 3.29 or less than -3.29, was an outlier and was omitted (Stevens, 1996).

The identification of multivariate outliers utilized Mahalanobis distance. This procedure is useful in discovering, “unusual combinations or scores on two or more variables” (Mertler & Vannatta, 2005, p. 29). First, the Mahalanobis distance for each institution was calculated. Institutions that have a Mahalanobis distance that exceeds the Chi-square critical value were eliminated, as recommended by Mertler & Vannatta (2005).

Tolerance statistics were used to test for multicollinearity. Multicollinearity poses a problem when potential explanatory (independent) variables are highly intercorrelated. The R^2 statistic may be limited since one or more variables may be measuring the same phenomenon (Mertler & Vannatta, 2005).

Since data for the entire population data was analyzed, inferential statistics are not appropriate. Effect size measures were used to interpret any practically important relationships or variance explained. The multiple regression coefficient, R^2 , is an accepted measure of effect size (Cohen, 1988). SPSS will automatically calculate this coefficient and R^2 represents the proportion of variance in the dependent variable explained by the independent variable(s). The effect size for R^2 was interpreted using Cohen’s descriptors for the R^2 coefficient (Table 2).

Table 2. Cohen’s (1988) Descriptors for Interpreting the Effect Size for the R^2 Coefficient

R^2	Effect size interpretation
.0196-.1299	Small effect size
.1300-.2599	Medium effect size
.2600 or larger	Large effect size

Pilot Test

A pilot test was conducted to assess data retrieval methods, data availability, and to perform an overall evaluation of the IPEDS database’s suitability for this research project. The data collection procedures described above were used to collect data for three non-SREB

member states (Illinois, Indiana, and Ohio) for the pilot test. This pilot test was created to revise data extraction methods and calculations; but no changes were needed.

Institutional Review Board Approval

Approval for the study was obtained through the Louisiana State University Institutional Review Board (IRB) for Human Subject Protection prior to data collection. The approved application is presented in Appendix B.

CHAPTER 4: RESULTS

The purpose of this study was to determine if an optimal allocation of financial resources by functional classification existed that significantly increased freshman retention rates for public community colleges in the Southern United States. The dependent variable for this study was the fall-to-fall retention rate for first-time full-time students.

This study utilized data reported to the Integrated Postsecondary Education Data System (IPEDS). Specifically, this study queried information for the year 2008 for all public community colleges located in SREB states ($N = 402$). This data was transferred into a Microsoft Excel spreadsheet. The results described below list the variables retrieved for this study. The selected data joined data from IPEDS with data from the U.S. Department of Education listing the accrediting agency for each institution. Subsequent analysis revealed that 37 schools were not accredited by a regional accrediting agency and these schools were removed from the population of the study. In addition, one college did not report its retention rates and was also removed from the study. After performing these procedures, data from 364 institutions remained in the study. SPSS statistical software was used to analyze the data.

The results for objective one reported descriptive statistics for the independent variables of financial allocation by functional area. The results of objectives two and three explored the relationship and possible predictive models using financial allocation by functional area and the fall-to-fall retention rate for first-time full-time students, or the dependent variable.

The results of objective four described additional independent variables for selected demographic characteristics of the institutional student population. The results of objectives five and six explored the relationship and possible predictive models, using financial allocation by functional area and by adding selected demographic characteristics of the institutional student

population as the independent variables, with the fall-to-fall retention rate for first-time full-time students as the dependent variable.

Financial allocation and student population data retrieved from the IPEDS Data Center provided numerical information as whole numbers or integers. Information in this study reported directly from the IPEDS database, such as the maximum and minimum values for each variable are reported without a fractional or decimal parts.

Objective One Results

Describe the spending as a percentage of total expenditures by functional classification for public community colleges in the Southern United States. The functional categories include

- Instructional expenses as a percent of total core expenses
- Academic support expenses as a percent of total core expenses
- Student service expenses as a percent of total core expenses
- Institutional support expenses as a percent of total core expenses
- Other core expenses as a percent of total core expenses
- The fall-to-fall full-time retention rate as the dependent variable

Objective one produced the following descriptive statistics to measure the dispersion and distribution of the data: mean, standard deviation, minimum, maximum, skewness, and a count of univariate outliers. Tabachnick and Fidell (2007) define univariate outliers for large populations as those cases having standardized scores of more or less than 3.29 standard deviations from the mean, or those cases with less than a one in 2,000 chance of occurring.

Instruction Expenses as a Percent of Total Core Expenses

The first variable measured was the percent of total core expenses spent on instruction. The average percentage allocated to instruction was 41.45% ($N = 364$, $SD = 7.23$), with 16% as

the lowest percentage reported and 72% the highest. The skewness was -.27 and three cases were univariate outliers (see Table 3).

Table 3. Selected Statistical Descriptors of Financial Independent Variables and Dependent Variable of Retention Rate for Public Community Colleges in the Southern United States.

Variable	<i>M</i>	<i>SD</i>	Min ^a	Max ^a	Skewness	Outliers ^b
Financial Independent Variables:						
Retention Rate	55.76	9.71	9	92	-0.55	4
Instruction	41.45	7.23	16	72	-0.27	3
Other Core Expenses	26.51	6.69	7	51	0.81	2
Institutional Support	14.02	4.04	2	37	0.88	3
Student Services	8.73	2.99	2	25	1.28	5
Academic Support	7.77	3.38	1	21	0.58	2
Dependent Variable:						
Retention Rate	55.76	9.71	9	92	-0.55	4

Note. *N* = 364.

^aMaximum and minimum data are reported directly from the IPEDS database which reported these variables as whole numbers and did not include fractional or decimal parts. ^bUnivariate outliers are defined as cases with standardized values less than or greater than 3.29 standard deviations from the mean (Tabachnick & Fidell, 2007, p. 73).

Academic Support Expenses as a Percent of Total Core Expenses

The second variable measured was the percent of total core expenses spent on academic support. The average percentage allocated to academic support was 7.77% (*N* = 364, *SD* = 3.38), with 1% as the lowest percentage reported and 21% the highest. The skewness was .58 and two cases were univariate outliers (see Table 3).

Student Services Expenses as a Percent of Total Core Expenses

The third variable measured was the percent of total core expenses spent on student services. The average percentage allocated to student services was 8.73% (*N* = 364, *SD* = 2.99), with 2% as the lowest percentage reported and 25% the highest. The skewness was 1.28 and five cases were univariate outliers (see Table 3).

Institutional Support Expenses as a Percent of Total Core Expenses

The fourth variable measured was the percent of total core expenses spent on institutional support. The average percentage allocated to institutional support was 14.02% ($N = 364$, $SD = 4.04$), with 2% as the lowest percentage reported and 37% the highest. The skewness was .88 and three cases were univariate outliers (see Table 3).

Other Core Expenses as a Percent of Total Core Expenses

The final independent variable measured was the percent of total core expenses spent on other expenses. The average percentage allocated to other core expenses was 26.51% ($N = 364$, $SD = 6.69$), with 7% as the lowest percentage reported and 51% the highest. The skewness was .81 and two cases were univariate outliers (see Table 3).

Dependent Variable, Fall-To-Fall Retention Rate of First-Time Full-Time Students

The dependent variable for this study is the fall-to-fall retention rate of first-time full-time students. The fall-to-fall retention rate of first-time full-time students was 55.76% ($N = 364$, $SD = 9.71$), with 9% as the lowest percentage reported and 92% the highest. The skewness was -.55 and four cases were univariate outliers (see Table 3).

Objective Two Results

Objective two is to determine if a relationship exist between spending by each functional classification and the fall-to-fall retention rate of first-time full-time students. The results of objective two follow.

A Pearson product-moment correlation coefficient was computed to assess the relationship between the fall-to-fall retention rate of first-time full-time students in the Southern United States and the following variables

- Instruction expenses as a percent of total core expenses (Instruction),
- Academic support expenses as a percent of total core expenses (Academic Support),
- Student services expenses as a percent of total core expenses (Student Services),

- Institutional support expenses as a percent of total core expenses (Institutional Support), and
- Other core expenses as a percent of total core expenses (Other Core Expenses).

Options selected in the SPSS program also included “zero-order correlations” and “exclude cases listwise.” Data for this study included the entire population, enumeration, or nonrandom data. According to Garson (2009), “. . . significance tests are not appropriate for inferential analysis.” However, Garson has held that one can report significance as “an arbitrary criterion” in honor of its common use “in social science for exploratory analysis of nonrandom data.” For this reason, the significance reported in Table 4 includes Garson’s suggested footnote. Similarly, because the entire population is included rather than a random sample, the partial correlations obtained for the population parameter represent the actual relationship between fall-to-fall retention rate of first-time full-time students in the Southern United States for 2008 and each of the five financial variables listed above. The actual correlation and the effect sizes are reported in Table 4, and should be used to interpret the significance of the data.

Because all results have a correlation coefficient between plus or minus 0.30. The results indicate that “little, if any correlation” (Hinkle, Wiersma, & Jurs, 2003, p. 109) exists between financial allocation by function and freshman retention. No correlation between the variables exceeded plus or minus 0.186. The exact correlation between freshman retention and percentage spent on instruction ($r = 0.186$), retention and percentage spent on academic support ($r = 0.084$), retention and percentage spent on student services, ($r = -0.121$), retention and percentage spent on institutional support, ($r = 0.024$) and retention and percentage spent on other expenses ($r = -0.147$) are reported in Table 4.

Objective Three Results

Objective three was to determine if a model existed that suggests the optimal financial allocation by functional classification to maximize first-year retention rates. This analysis used

the following potential explanatory variables of financial allocation by category: instruction expenses as a percentage of total core expenses, academic support expenses as a percentage of

Table 4. The Actual Correlation Between Fall-To-Fall Retention Rate of First-Time Full-Time Students in the Southern United States and Each of the Five Financial Variables for Public Community Colleges in the Southern United States.

Variable	Correlation With Retention		Effect Size
	<i>R</i>	<i>P</i>	
Instruction	.186	<.001	Little, if any correlation
Other Core Expenses	-.147	.005	Little, if any correlation
Student Services	-.121	.021	Little, if any correlation
Academic Support	.084	.109	Little, if any correlation
Institutional Support	.024	.653	Little, if any correlation

Note. $N = 364$. All of the effect sizes for the correlations were interpreted according to Hinkle, Wiersma, & Jurs (2003), see Table 1. Because the present study does not use randomly sampled data, but the entire population, significance tests are not appropriate for inferential analysis. However, significance is reported here as an arbitrary criterion in deference to its widespread use in social science for exploratory analysis of nonrandom data (Garson, 2009).

total core expenses, student service expenses as a percentage of total core expenses, institutional support expenses as a percentage of total core expenses, and other core expenses as a percentage of total core expenses.

Prior to analysis of the dependent variable (retention), the potential explanatory variables were examined through various SPSS operations for missing values or cases, and fit between their distribution and the assumptions of multivariate analysis. This data analysis examined 364 cases.

The analysis identified 13 cases of univariate outliers because of their extreme z -scores in excess of plus or minus 3.29 standard deviations from the mean. Mahalanobis Distance with $p < .001$ was derived from leverage scores and SPSS was used to identify another five cases as multivariate outliers. Examination of these cases revealed that many of the outlier institutions have specific or unique missions, such as institutions located on high school campuses, adult

training centers, or institutions operated by military academies. Removing the outliers for the Student Services variable adjusted the skewness below one, thus removing the need for transformation of this and all other variables. After meeting the assumptions for multiple regression models, 346 cases remained in the study.

The sample size was adequate for forward regression. According to Tabachnick and Fell (2007), a minimum of 50 plus eight times the number of predictors ($50 + 8m$) was required; therefore, a minimum of 90 observations was required ($50 + 8 \times 5$). The sample of 346 colleges substantially exceeded this requirement. Multicollinearity did not exist in the regression analysis. None of the independent variables had a tolerance variable below .10 (Mertler & Vannatta, 2005). Forward multiple regression was conducted to determine if one or more of the potential explanatory variables were predictors of fall-to-fall first-time full-time student retention for public two-year higher education institutions located in an SREB state.

Regression results for the financial allocation of independent variables indicated an overall model of a single predictor, Other Core Expenses as a percent of total core expenses. Per Cohen (1988) the effect size of the R^2 for this model does not meet the minimum of .0196 necessary to meet the classification of “small effect size” for predicting fall-to-fall first-time full-time freshman retention rates for Southern Community Colleges ($R^2 = .013$, $R^2_{Adj} = .010$, $F(1, 344) = 4.414$, $p < .050$). This model has a significance of .036 or there is 3.6% chance the results of the model are from random chance. This model accounted for 1.3% of the variance in freshman student retention for public community colleges in an SREB member state. Table 5 presents a summary of the regression analysis.

Objective Four Results

Objective four was to describe public community colleges in the Southern United States by institutional characteristics, including:

- Number of students enrolled in the institution (total enrollment)
- Number of students enrolled part-time in the institution (part-time enroll)

Table 5. Forward Regression Analysis Model Using Financial Allocation to Predict Freshman Retention for Community Colleges in SREB States.

	<i>S</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>
Regression	387.35	1	387.53	4.414	.036
Residual	30,188.63	344	87.76		
Total	30,575.99	345			

Explanatory Variables in Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	Change Statistics		
					<i>R</i> ² Change	<i>F</i> Change	<i>P</i> of <i>F</i> Change
Other Core Expenses	.113	.013	.010	9.37	.013	4.414	.036

Excluded variables				
Variable	Beta In	<i>t</i>	<i>P</i>	Partial <i>r</i>
Instruction	.005	.079	.937	.004
Academic Support	.069	1.209	.227	.065
Student Services	-.087	1.635	.103	-.088
Institutional Support	.051	.912	.362	.049

Note. N = 346. Dependent variable: Freshman Retention. The combined variables included in the final multiple regression model do not meet the value necessary for a small effect size according to Cohen (1988).

Zero-Order Correlations Among All Variables

Variable	1	2	3	4	5	6
1 Full-time retention rate	1.000	0.075	<i>0.100</i>	-0.087	0.078	<i>-0.113</i>
2 Instruction		1.000	<i>-0.119</i>	-0.327	-0.193	-0.637
3 Academic Support			1.000	0.018	-0.033	-0.354
4 Student Services				1.000	-0.134	-0.006
5 Institutional Support					1.000	-0.272
6 Other Core Expenses						1.000

Note. N = 346. Because the present study does not use randomly sampled data, but the entire population, significance tests are not appropriate for inferential analysis. However, significance is reported here as an arbitrary criterion in deference to its widespread use in social science for exploratory analysis of nonrandom data (Garson, 2009). *Italics* $p < .05$; **Bold** $p < .01$.

- Percent of total enrollment who are white non-Hispanic (percent white)
- Percent of total enrollment who are black non-Hispanic (percent black)

- Percent of total enrollment who are Hispanic (percent Hispanic)
- Percent of total enrollment who are women (percent women)
- Percent of undergraduate enrollment under age 18 (percent under 18)
- Percent of undergraduate enrollment age 18 to 24 (percent 19-24)
- Percent of undergraduate enrollment age 25 to 64 (percent 25-64)
- Percent of undergraduate enrollment over age 65 (percent 65+)
- Total amount spent on core expenses (total core expense)
- Percentage of students receiving Federal grant aid (percent federal aid)
- Percentage of students receiving Pell Grants (percent Pell Grants)
- Percentage of students receiving Federal Loan aid (Percent Fed Loan)
- Number of full-time equivalent students (FTE's)
- Amount of core expenses per full-time equivalent student (Spending per FTE)

Objective four produced the following descriptive statistics to measure the dispersion and distribution of the data: mean, standard deviation, minimum, maximum, skewness, and a count of univariate outliers. Tabachnick and Fidell (2007) define univariate outliers for large populations as those cases with standardized scores of more than or less than 3.29 standard deviations from the mean, or those cases with less than a one in 2,000 chance of occurring.

Number of Students Enrolled in the Institution

The first variable measured in objective four was the number of students enrolled in the institution. The average enrollment was 5,754 ($N = 364$, $SD = 6,745$), with 113 as the lowest enrollment reported and 48,169 the highest. The skewness was 3.23, and seven cases were univariate outliers (see Table 6).

Number of Students Enrolled Part-Time in the Institution

The second variable measured in objective four was the number of students enrolled part-time in the institution. The average part-time enrollment was 3,427 ($N = 364$, $SD = 4,489$), with

Table 6. Selected Statistical Descriptors for Demographic Characteristics of the Institutional Student Populations for Public Community Colleges in the Southern United States.

Variable	<i>M</i>	<i>SD</i>	Min ^a	Max ^a	Outliers ^b	Skewness
Total enrollment	5,753.47	6,745.55	113	48,169	7	3.23
Part-time enrollment	3,427.04	4,488.78	19	34,113	8	3.46
Percent white	63.98	20.34	1	98	0	-.75
Percent black	22.27	18.49	0	95	4	1.36
Percent Hispanic	7.31	13.21	0	95	8	3.78
Percent women	61.60	6.90	27	86	5	-1.03
Percent under 18 ^c	10.76	8.57	0	39	2	1.11
Percent 19-24 ^c	51.62	10.65	27	98	1	.46
Percent 25-64 ^c	37.17	9.44	0	63	1	-.26
Percent 65 and over ^c	.31	.69	0	5	7	3.09
Total core expense ^d	35,968	37,208	1,349	279,327	8	3.13
Percent federal aid ^e	47.53	17.18	1	100	0	.20
Percent Pell Grants ^e	45.30	16.46	0	91	0	.16
Percent federal loan ^e	14.83	16.31	0	71	1	1.17
Full-time equiv. students	3,477.04	3,835.59	100	25,509	7	3.02
Spending per FTE ^f	11,516	3,606	5,131	31,437	5	1.52

Note. $N=364$. ^aMaximum and minimum data are reported directly from the IPEDS database which reported these variables as whole numbers and did not include fractional or decimal parts.

^bUnivariate outliers are defined as cases with standardized values less than or greater than 3.29 standard deviations from the mean (Tabachnick & Fidell, 2007, p. 73). ^c $N = 278$. ^dFigures reported in 1,000s. ^e $N = 359$. ^fRounded to the nearest dollar.

19 as the lowest enrollment reported and 34,113 the highest. The skewness was 3.46 and eight cases were univariate outliers (see Table 6).

Percent of Total Enrollment Who Are White Non-Hispanic

The third variable measured in objective four was the percent of total enrollment who are white non-Hispanic enrolled in the institution. The average percentage of white enrollment was 63.98% ($N = 364$, $SD = 20.336$), with 1% as the lowest percentage reported and 98% as the highest. The skewness was -.75 and no cases were univariate outliers (see Table 6).

Percent of Total Enrollment Who Are Black Non-Hispanic

The fourth variable measured in objective four was the percent of total enrollment who are black non-Hispanic enrolled in the institution. The average percentage of black enrollment was 22.27% ($N = 364$, $SD = 18.485$), with 0% as the lowest percentage reported and 95% as the highest. The skewness was 1.35 and four cases were univariate outliers (see Table 6).

Percent of Total Enrollment Who Are Hispanic

The fifth variable measured in objective four was the percent of total enrollment who are Hispanic enrolled in the institution. The average percentage of Hispanic enrollment was 7.31% ($N = 364$, $SD = 13.213$), with 0% as the lowest percentage reported and 95% as the highest. The skewness was 3.78 and eight cases were univariate outliers (see Table 6).

Percent of Total Enrollment Who Are Women

The sixth variable measured in objective four was the percent of total enrollment who are women enrolled in the institution. The average percentage of woman enrollment was 61.60% ($N = 364$, $SD = 6.897$), with 27% as the lowest percentage reported and 86% as the highest. The skewness was -1.03 and five cases were univariate outliers (see Table 6).

Percent of Undergraduate Enrollment Under Age 18

The seventh variable measured in objective four was the percent of total enrollment that was undergraduate enrollment under age 18. The average percentage of enrollment under 18 was 10.76% ($N = 364$, $SD = 8.565$), with 0% as the lowest percentage reported and 39% as the highest. The skewness was 1.11 and two cases were univariate outliers (see Table 6).

Additional examination of the data revealed that an excessive number (21% or 78 cases) of schools did not report the age data of its students. Per Mertler and Vannatta (2005, p. 62)

variables with more than 15% of the cases missing data should be removed from the study.

Thus, the results of this study will not include data on the age of the student population.

Percent of Undergraduate Enrollment Age 18 to 24

The eighth variable measured in objective four was the percent of total enrollment that was undergraduate enrollment age 18 to 24. The average percentage of enrollment age 18 to 24 was 51.62% ($N = 286$, $SD = 10.647$), with 27% as the lowest percentage reported and 98% as the highest. The skewness was .46 and one case was a univariate outlier (see Table 6).

Additional examination of the data revealed that an excessive number (21% or 78 cases) of schools did not report the age data of its students. Per Mertler and Vannatta (2005, p. 62) variables with more than 15% of the cases missing data should be removed from the study. Thus, the results of this study will not include data on the age of the student population.

Percent of Undergraduate Enrollment Age 25 to 64

The ninth variable measured in objective four was the percent of total enrollment that was undergraduate enrollment age 25 to 64. The average percentage of enrollment ages 25 to 64 was 37.17% ($N = 286$, $SD = 9.438$), with 0% as the lowest percentage reported and 63% as the highest. The skewness was -.26 and one case was a univariate outliers (see Table 6).

Additional examination of the data revealed that an excessive number (21% or 78 cases) of schools did not report the age data of its students. Per Mertler and Vannatta (2005, p. 62) variables with more than 15% of the cases missing data should be removed from the study. Thus, this results of this study will not include data on the age of the student population.

Percent of Undergraduate Enrollment Over Age 65

The tenth variable measured in objective four was the percent of total enrollment that was undergraduate enrollment over age 65. The average percentage of enrollment over age 65 was

.31% ($N = 286$, $SD = .699$), with 0% as the lowest percentage reported and 5% as the highest.

The skewness was 3.09 and seven cases were univariate outliers (see Table 6).

Addition examination of the data revealed that an excessive number (21% or 78 cases) of schools did not report the age data of its students. Per Mertler and Vannatta (2005, p. 62) variables with more than 15% of the cases missing data should be removed from the study. Thus, this results of this study will not include data on the age of the student population.

Total Amount Spent on Core Expenses

The eleventh variable measured in objective four was the total amount spent on core expenses. The average amount spent on core expenses was \$35,968,096 ($N = 364$, $SD = \$37,208,541$), with \$1,349,473 as the lowest amount reported and \$279,327,629 as the highest. The skewness was 3.13 and eight cases were univariate outliers (see Table 6).

Percentage of Students Receiving Federal Grant Aid

The twelfth variable measured in objective four was the percentage of students receiving federal grant aid. The average percentage receiving federal grant aid was 47.53% ($N = 364$, $SD = 17.180$), with 1% as the lowest percentage reported and 100% as the highest. The skewness was .20 and no cases were univariate outliers (see Table 6).

Five cases had missing data. The study will replace these five cases with the mean of reporting cases of 47.53% (Tabachnick & Fidell, 2007, p. 66).

Percentage of Students Receiving Pell Grants

The thirteenth variable measured in objective four was the percentage of students receiving Pell Grants. The average percentage receiving Pell Grants was 45.30% ($N = 364$, $SD = 16.455$), with 0% as the lowest percentage reported and 91% as the highest. The skewness was .16 and no cases were univariate outliers (see Table 6).

Five cases had missing data. The study will replace these five cases with the mean of reporting cases of 45.30% (Tabachnick & Fidell, 2007, p. 66).

Percentage of Students Receiving Federal Loan Aid

The fourteenth variable measured in objective four was the percentage of students receiving federal loan aid. The average percentage receiving loan aid ($N=359$) was 14.83% ($N = 364$, $SD = 16.31$), with 0% as the lowest percentage reported and 71% as the highest. The skewness was 1.17 and one case was a univariate outlier (see Table 6).

Five or 1.2% of the cases had missing data. The study will replace these five cases with the mean of reporting cases of 14.83% (Tabachnick & Fidell, 2007, p. 66).

Number of Full-Time Equivalent Students

The fifteenth variable measured in objective four was the number of full-time equivalent students (FTE) at the institution. The average number of FTEs 3,477.04 ($N = 364$, $SD = 3,835.59$), with 100 as the lowest number reported and 25,509 as the highest. The skewness was 3.02 and seven cases were univariate outliers (see Table 6).

Amount of Core Expenses per Full-Time Equivalent Student

The sixteenth variable measured in objective four was the amount of core expenses per full-time equivalent student at the institution. The average spending per FTE was \$11,516 ($N = 364$, $SD = 3,606$), with \$5,131 as the lowest amount reported and \$31,437 as the highest. The skewness was 1.52 and five cases were univariate outliers (see Table 6).

Objective Five Results

The purpose of objective five was to determine if a relationship existed between additional institutional characteristics and the fall-to-fall retention rate of first-time full-time students. The results of objective five follow.

A Pearson product-moment correlation coefficient was computed to assess the relationship between the fall-to-fall retention rate of first-time full-time students in the Southern United States and

- The number of students enrolled in the institution (total enrollment)
- The number of students enrolled part-time in the institution (part-time enroll)
- The percent of total enrollment who are white non-Hispanic (percent white)
- The percent of total enrollment who are black non-Hispanic (percent black)
- The percent of total enrollment who are Hispanic (percent Hispanic)
- The percent of total enrollment who are women (percent Women)
- The percent of undergraduate enrollment under age 18 (percent under 18)
- The percent of undergraduate enrollment age 18 to 24 (percent 19-24)
- The percent of undergraduate enrollment age 25 to 64 (percent 25-64)
- The percent of undergraduate enrollment over age 65 (percent 65+)
- The total amount spent on core expenses (total core expense)
- The percentage of students receiving federal grant aid (percent federal aid)
- The percentage of students receiving Pell Grants (percent Pell Grants)
- The percentage of students receiving federal loan aid (percent federal loan)
- The number of full-time equivalent students (FTEs)
- The amount of core expenses per full-time equivalent student (spending per FTE)

Options selected in the SPSS program also included “zero-order correlations” and “exclude cases listwise.” Data for this study included the entire population, enumeration, or nonrandom data. According to Garson (2006), “significance tests are not appropriate for inferential analysis.” However, Garson has held that one can report significance as “an arbitrary criterion”

in honor of its common use “in social science for exploratory analysis of nonrandom data.” For this reason, the significance reported in Table 7 includes Garson’s suggested footnote. Similarly, because the entire population is included rather than a random sample, the partial correlations obtained for the population parameter represent the actual relationship between fall-to-fall retention rate of first-time full-time students in the Southern United States and each of the five financial variables listed above.

Because all results have a correlation coefficient between plus or minus .30, the results indicate “little, if any correlation” (Hinkle, Wiersma, & Jurs, 2003, p. 109) exists between the enrollment size, race, and age descriptors of institutional student bodies and freshman retention. These descriptors include the number of students enrolled in the institution and freshman retention ($r = 0.225$), the number of students enrolled part-time in the institution and freshman retention ($r = 0.226$), the percent of total enrollment who are white non-Hispanic and freshman retention ($r = 0.135$), the percent of total enrollment who are black non-Hispanic and freshman retention ($r = -0.205$), the percent of total enrollment who are Hispanic and freshman retention ($r = 0.037$), the percent of total enrollment who are women and freshman retention ($r = -0.023$), the percent of undergraduate enrollment under age 18 and freshman retention ($r = 0.062$), the percent of undergraduate enrollment age 18 to 24 and freshman retention ($r = 0.028$), the percent of undergraduate enrollment age 25 to 64 and freshman retention ($r = 0.024$), the percent of undergraduate enrollment over age 65 and freshman retention ($r = -0.020$).

The results also show that “little, if any correlation” exists between other institutional student body descriptors and freshman retention. These descriptors include the total amount spent on core expenses and freshman retention ($r = 0.227$), the percentage of students receiving federal grant aid and freshman retention ($r = -0.184$), the percentage of students receiving Pell

Table 7. The Actual Correlation Between Fall-to-Fall Retention Rate of First-Time Full-Time Students in the Southern United States and Each of the Sixteen Variables Describing the Characteristics of the Student Bodies for Public Community Colleges in the Southern United States.

Variable	Correlation With Retention	Significance	Effect Size
Total core expense	0.227	<.001	Little, if any correlation
Part-time enrollment	0.226	<.001	Little, if any correlation
Total enrollment	0.225	<.001	Little, if any correlation
FTEs	0.221	<.001	Little, if any correlation
Percent black	-0.205	<.001	Little, if any correlation
Percent federal aid ^b	-0.184	<.001	Little, if any correlation
Percent Pell Grants ^b	-0.153	0.004	Little, if any correlation
Percent federal loan ^b	-0.142	0.007	Little, if any correlation
Percent white	0.135	0.010	Little, if any correlation
Percent age under 18 ^a	0.062	0.298	Little, if any correlation
Percent Hispanic	0.037	0.487	Little, if any correlation
Percent age 18-24 ^a	0.028	0.639	Little, if any correlation
Full-time equivalent students	-0.027	0.606	Little, if any correlation
Percent age 25-64 ^a	0.024	0.687	Little, if any correlation
Percent women	-0.023	0.661	Little, if any correlation
Percent age 65 and over ^a	-0.020	0.739	Little, if any correlation

Note: $N = 364$. All of the effect sizes for the correlations were interpreted according to Hinkle, Wiersma, & Jurs (2003), see Table 1. Because the present study does not use randomly sampled data, but the entire population, significance tests are not appropriate for inferential analysis. However, significance is reported here as an arbitrary criterion in deference to its widespread use in social science for exploratory analysis of nonrandom data (Garson, 2009).

^a $N = 274$. ^b $N = 359$.

Grants and freshman retention ($r = -0.153$), the percentage of students receiving federal loan aid and freshman retention ($r = -0.142$), the number of full-time equivalent students and freshman retention ($r = -0.027$), and the amount of core expenses per full-time equivalent student and freshman retention ($r = 0.227$).

Objective Six Results

Determine if adding additional institutional characteristics created or improved a predictive model that suggests the optimal financial allocation by functional classification to maximize

first-year retention rates. In addition to the variables listed in objective one, this study will use the potential explanatory variables of listed below:

- The number of students enrolled in the institution (total enrollment)
- The number of students enrolled part-time in the institution (part-time enroll)
- The percent of total enrollment who are white non-Hispanic (percent white)
- The percent of total enrollment who are black non-Hispanic (percent black)
- The percent of total enrollment who are Hispanic (percent Hispanic)
- The percent of total enrollment who are women (percent women)
- The total amount spent on core expenses (total core expense)
- Instructional expenses as a percentage of total core expenses (instruction)
- Academic support expenses as a percentage of total core expenses (academic support)
- Student service expenses as a percentage of total core expenses (student services)
- Institutional support expenses as a percentage of total core expenses (institutional support)
- Other core expenses as a percentage of total core expenses (other core expenses)
- The percentage of students receiving Federal grant aid (percent federal aid)
- The percentage of students receiving Pell grants (percent Pell Grants)
- The percentage of students receiving Federal loan aid (percent federal loan)
- The number of full-time equivalent students (FTEs)
- The amount of core expenses per full-time equivalent student (spending per FTE)

Prior to analysis, the independent variables were examined through various SPSS operations for reasonableness of data, missing values, and fit between their distribution and the assumptions of multivariate analysis.

As mentioned in objective four, the four variables dealing with the ages of students were removed from the study because 21% of the cases were missing. Additional analysis discovered that the following variables: the percentage of students receiving Pell Grants, the percentage of students receiving federal loan aid, and the number of full-time equivalent students had five institutions (cases) that were missing data. The study replaced these five cases in each of the three variables with the mean values the other 359 institutions reported.

Examination of a histogram for the variable “number of students enrolled in the institution” revealed a separate population of institutions with very large enrollments with a gap at the 16,000-student mark. The study removed 20 institutions with enrollments in excess of 16,000. Additional analysis revealed 36 cases as univariate outliers because of their extreme z -scores in excess of plus or minus 3.29 standard deviations from the mean. Additional study identified these cases as having large minority and single gender populations, extreme allocations on spending functions, spending per FTE, and number of FTEs. The study removed these cases because they differed greatly from the rest of the population.

Using Mahalanobis Distance with $p < .001$, derived from leverage scores, analysis of SPSS output identified another nine cases as multivariate outliers. Examination of these cases revealed that many of the outlier institutions have specific missions, such as institutions located on high school campuses, institutions operated as military academies, institution with large Native American enrollments, and institutions offering specialized training in areas such as health science and technology. There were 294 cases or institutions for this objective.

The sample size was adequate for forward regression. According to Tabachnick and Fell (2007), a minimum of 50 plus eight times the number of predictors ($50 + 8m$) were required. Based on the recommendations by Tabachnick and Fell, a minimum of 186 observations were

required ($50 + 8 \times 17$). The sample of 294 colleges substantially exceeded this requirement. Multicollinearity did not exist in the regression analysis. None of the independent variables had a tolerance value below .10 (Mertler & Vannatta, 2005).

The study conducted forward multiple regression to determine which of the following independent variables predict fall-to-fall first time full-time student retention for public two-year higher education institutions that were located in an SREB state. The independent variables are listed in the first paragraph in objective six.

Regression results indicated an overall model of three predictors (percent white, part-time enrollment, and instruction) that have a significant effect in predicting fall-to-fall first time full-time freshman retention rates $R^2 = .107$, $R^2_{Adj} = .097$, $F(3, 294) = 11.587$, $p < .001$. This model accounts for 10.7% of the variance in freshman student retention for public community colleges in an SREB member state. The combined variables included in the final multiple regression model represent a “small effect size” per Cohen (1988). Table 8 presents a summary of the regression model.

An additional procedure creating a second regression model was performed after transforming five variables with a skewness in excess of 1.0 (the square root of the number of students enrolled part-time in the institution, the square root of the percent of total enrollment that are white non-Hispanic, the log of the percent of total enrollment that are Hispanic, and the square root of the total amount spent on core expenses). These transformations brought the skewness for each variable to below 1.0. This second regression model only improved R^2 by .005 or .5% or to an R^2 of .112. These transformations had no material effect on the model’s effect size.

Table 8. Forward Regression Analysis Model Using Financial Allocation and Student Body Descriptors to Predict Freshman Retention for Community Colleges in SREB States.

	<i>S</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P</i>
Regression	2,624.48	3	874.83	11.587	<.001
Residual	21,971.66	291	75.50		
Total	24,594.15	294			

Explanatory Variables in Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	Change Statistics		
					<i>R</i> ² Change	<i>F</i> Change	<i>P</i> of <i>F</i> Change
Percent white enrollment	.239	.057	.054	8.90	.057	17.789	<.001
Part-time enrollment	.299	.090	.083	8.76	.032	10.348	<.001
Instruction percentage	.327	.107	.097	8.69	.017	5.603	<.001

Excluded variables				
Variable	Beta In	<i>t</i>	<i>P</i>	Partial <i>r</i>
Total enrollment	-.088	-.532	.595	-.031
Percent black students	.139	1.100	.272	.064
Percent Hispanic students	-.039	-.644	.520	-.038
Percent women	.008	.126	.900	.007
Total expenses	.077	.888	.375	.052
Academic support percent	.052	.934	.351	.055
Student service percent	-.041	-.702	.483	-.041
Institutional support percent	.056	.991	.322	.058
Other core expense	-.024	-.333	.739	-.020
Percent with federal aid	-.026	-.428	.669	-.025
Percent receiving Pell Grants	.001	.011	.992	.001
Percent receiving loans	-.073	1.290	.198	-.076
FTE	-.054	-.531	.596	-.031
Spending per FTE	.072	1.188	.236	.070

Note. *N* = 295. Dependent variable: freshman retention. The combined variables included in the final multiple regression model represent a small effect size, per Cohen (1988). Zero-order correlations among all variables are listed in Appendix C

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Summary of Purpose and Specific Objectives

The purpose of this study was to determine if an optimal allocation of financial resources by functional classification existed that significantly increased freshman retention rates for public community colleges in the Southern United States. The dependent variable for this study was the fall-to-fall retention rate for first-time full-time students.

This study used the following objectives to guide this research:

1. Describe the spending as a percentage of total expenditures by functional classification for public community colleges in the Southern United States. The functional categories include
 - Instructional expenses as a percent of total core expenses
 - Academic support expenses as a percent of total core expenses
 - Student service expenses as a percent of total core expenses
 - Institutional support expenses as a percent of total core expenses
 - Other core expenses as a percent of total core expenses
 - The fall-to-fall full-time retention rate as the dependent variable
2. Determine if a relationship existed between spending by each functional classification and the fall-to-fall retention rate of first-time full-time students.
3. Determine if a model existed that suggests the optimal financial allocation by functional classification to maximize first-year retention rates. This study will use the following potential explanatory variables of financial allocation characteristics:
 - Instructional expenses as a percent of total core expenses
 - Academic support expenses as a percent of total core expenses
 - Student service expenses as a percent of total core expenses

- Institutional support expenses as a percent of total core expenses
 - Other core expenses as a percent of total core expenses
 - The fall-to-fall full-time retention rate as the dependent variable
4. Describe public community colleges in the Southern United States by additional institutional characteristics, including:
- The number of students enrolled in the institution
 - The number of students enrolled part-time in the institution
 - The percent of total enrollment who are white non-Hispanic
 - The percent of total enrollment who are black non-Hispanic
 - The percent of total enrollment who are Hispanic
 - The percent of total enrollment who are women
 - The percent of undergraduate enrollment under age 18
 - The percent of undergraduate enrollment age 18 to 24
 - The percent of undergraduate enrollment age 25 to 64
 - The percent of undergraduate enrollment over age 65
 - The total amount spent on core expenses
 - The percentage of students receiving federal grant aid
 - The percentage of students receiving Pell grants
 - The percentage of students receiving federal loan aid
 - The number of full-time equivalent students
5. Determine if a relationship existed between additional institutional characteristics and the fall-to-fall retention rate of first-time full-time students.

6. Determine if adding additional institutional characteristics created or improved a predictive model that suggests the optimal financial allocation by functional classification to maximize first-year retention rates. This study will use the potential explanatory variables of financial allocation characteristics listed in objective four, in addition to the variables listed in objective one.

Population

This study defines its target population as public two-year institutions located in a Southern Regional Education Board (SREB) member state. Relevant data for this entire population is accessible via the Integrated Postsecondary Education Data System (IPEDS).

More specifically, this study defines its target population as public two-year institutions located in one of the 16 Southern Regional Education Board (SREB) member state recognized by a regional accreditation agency to offer college transfer courses and participate in Federal financial aid programs. This study identified 364 institutions that meet these criteria.

Methodology

Based on the review of relevant literature, this study selected the specific independent variables of financial allocation by function and additional institutional characteristics.

Permission to complete this study was received from Louisiana State University's Institutional Review Board (IRB).

This study collected information reported to the Integrated Postsecondary Education Data System (IPEDS) for the study's independent and the dependent variable. Specifically, this study queried information for the year 2008 for all public community colleges located in SREB states.

Objectives one and four, after identifying variables that report financial allocation by function and additional institutional characteristics for the target population, used descriptive statistics to reveal the count, maximum, minimum, mean, standard deviation, skewness, and

number of outliers. This information is required in determining if the study needs to address missing data, outliers, normality, and linearity issues for its variables before performing a multiple regression analysis (Tabachnick & Fidell, 2007, p. 117).

Objectives two and five sought to determine relationship between the independent variables in the study and the dependent variable freshman retention rates. Pearson product-moment correlation coefficient was used to measure the relationship and to evaluate the effect size of each relationship. Correlation determines the relationship between two variables, but mere correlation does not imply causation. Ideally, evidence is required from the related literature to support an argument of causation (Aldrich, 1997).

Objective three sought to create a model that would indicate the proper allocation of financial resources by function to maximize student retention for institutions for the target population. This study also evaluated the effect size for the resulting model.

Objective six sought to create a regression model that would indicate the proper allocation of financial resources by function and additional institutional characteristics to maximize student retention for institutions for the target population. This study also evaluated the effect size for the resulting model.

Summary of Major Findings

Objective One Results

Public community colleges in one of the 16 SREB states allocate an average of 41.45% to instructional spending, 7.77% to academic support, 8.73% to student services, 14.02% to institutional support, and 26.51% to other core expenses. In terms of retention, the dependent variable for this study, average public community college in the SREB has a fall-to-fall first-time full-time freshman retention rate of 55.76% (see Table 3).

Objective Two Results

This study found “little, if any correlation” between financial allocation by the functional areas of instructional expenses as a percent of total core expenses, academic support expenses as a percent of total core expenses, student service expenses as a percent of total core expenses, institutional support expenses as a percent of total core expenses, and other core expenses as a percent of total core expenses and the fall-to-fall first-time full-time retention rate. None of the results exceeded a correlation coefficient of plus or minus .186 (see Table 4).

Objective Three Results

The results of this study found no model that meets the minimum effect size necessary to predict the fall-to-fall first-time full-time retention rate using financial allocation by the functional areas as the independent variables. The results listed in Table 5 show the model’s R^2 of .013 is lower than .0196, the criteria to meet the classification of for “small effect size” (Cohen, 1988).

Objective Four Results

Public community colleges in an SREB state had an average enrollment of about 5,753 students, a part-time enrollment of about 3,427, and Fulltime equivalent students (FTE) of approximately 3,477. Financially, public community colleges in the SREB spent an average of about \$11,516 per FTE. The racial breakdown had an average of 63.98% white, 22.27% black, and 7.31% Hispanic. The average female enrollment was 61.60%. The study removed data on age characteristics of the student body because 78 or 21% of the variables were missing (see Table 6).

Objective Five Results

The results of this study found “little, if any correlation” between institutional student body characteristics and the fall-to-fall first-time full-time retention rate. None of the results exceeded a correlation coefficient of plus or minus 0.227 (see Table 7).

Objective Six Results

The results of this study discovered a significant regression model that meets the criteria for “small effect size” necessary to predict the fall-to-fall first-time full-time retention rate using the independent variables of financial allocation by the functional areas and institutional student body characteristics. The model’s R^2 of .107 exceeds R^2 of .0196 necessary to meet the classification of “small effect size.” However, in order to create this model and meet the assumptions of multiple regression models, 69 cases were eliminated as outliers (See Table 8).

Conclusions, Implications, and Recommendations

Conclusion One

Regionally accredited community colleges in the Southern United States allocate more financial resources to instructional spending than to any other function. After instruction, on average, Southern community colleges allocate institutional resources to the functional areas of, listed from highest to lowest: other core expenses, institutional support, student services, and academic support. This conclusion is based on objective one results that show an allocation of 41.45%; 26.51%; 14.02%; 8.73%; and 7.77% respectively.

These results are consistent with data reported by the National Center for Education Statistics (2010) for all community colleges in the United States. The NCES reported instructional spending at about 39.5%, academic support at about 7.7%, student services at about 9.3%, institutional support at about 14.4%, and other core expenses at about 29.1% for all community colleges.

This information is of value to administrators of community colleges because it is essential for community college leaders to have knowledge of financial allocation statistics for their own institutions and to have an understanding of why their institution has or does not have a different allocation from the norm. While not advocating that any allocation of resources is more

desirable, administrators who understand why their allocation differs from the norm are ready to explain any deviations to college stakeholders.

The results from this study are averages from unweighted data, meaning a very large community college has the same value in calculating the mean as a very small institution. Future research should consider using weighted averages.

Conclusion Two

The results of this study found no relationship between the allocation of financial resources by functional area and freshman retention for community colleges in the SREB. The allocation of financial resources to instructional, academic support, student services, institutional support, or other core expenses was not related to community college freshman retention rates.

These results differ from the results of Gansemer-Topf and Schuh (2006), who found a “high correlation” for institutional support and a “moderate correlation” for instruction and academic support with student retention rates for private four-year colleges having selective admission. However, these results from community colleges support an additional finding of Gansemer-Topf and Schuh (2006) in that correlations between financial allocation and freshman retention decrease as the selectivity of the institution decreases. As described in Chapter Two, since public community colleges, by definition, are open admissions institutions, it follows that the relationship between spending allocation by function and freshman retention would be less than that of four-year institutions. These results indicate that community college administrators cannot increase freshman retention for the institution as a whole by reallocating financial resources to different functional areas.

A suggestion for future research is to determine if additional financial descriptors correlate to freshman retention for community colleges. Additional spending data by operational area

within functions is a possible variable. Future research could examine if salary or nonwage expenditures by function relate to freshman retention. Research could also examine if institutional funding sources, such as the percentage of revenue from state, local, and self-generated funds relate to freshman retention. Additional studies could also determine if the amount invested in new facilities has any relationship to freshman retention. Other research could perform this same study on institutional data stratified by high and low retention rates.

Another potential area for additional research is to add independent variables to this study. Other measures of persistence for community colleges are available for future research. These other measures could use certificates awarded, part-time student retention, successful transfer to four-year schools, and graduation rates as independent variables.

Conclusion Three

This study indicates no predictive regression model exists that proves any combination of financial allocation by function can predict freshman retention for community colleges in SREB states. No combination of allocation of financial resources to instructional, academic support, student services, institutional support, or other core expenses created a predictive model for community college freshman retention rates.

The results of this study differ from the results of studies on four-year colleges. Studies focusing on the allocation of financial resources, while addressing other segments of higher education besides community colleges, did find significant relationships with freshman retention. Kim, Rhoades, and Woodard (2003) spotlighted graduation rates at research institutions, Thomas and Bean (1988) concentrated on persistence at liberal arts colleges, Ryan (2004) focused on graduation rates at Carnegie I and II institutions, and Gansemer-Topf and Schuh (2006) addressed institutional selectivity and financial allocation on retention and graduation rates at

private baccalaureate liberal and general colleges and universities. These studies reported predictive regression models with large effect sizes and found varying combinations of variables explained student retention. These models utilized allocation of financial resources to instructional spending, academic support, and student services.

These results are inconsistent with the related literature on the principle that post-enrollment or post-matriculation factors exist that institutions can alter to increase freshman retention. These post-enrollment or post-matriculation theories advocate that institutional policies and practices can increase student persistence, attrition, and retention rates. As stated by Ryan (2004), noted theorists propose encouraging academic and social integration (Tinto, 1987), student interactions (Pascarella, 1985), student involvement (Astin, 1984), and student satisfaction (Bean, 1980) in order to improve student retention. These theories have developed over the past generation as the most common frameworks supporting most persistence, attrition, and retention studies (Ryan, 2004). The results of this study showed no relationship or ability to predict freshman retention by allocation of financial resources.

Although the literature does not provide evidence explaining why financial allocations by function does not predict community college student retention, reviewing the results of Gansemer-Topf and Schuh's (2006) study may give the best insight. In their study, the authors looked at private baccalaureate liberal and general colleges and universities by selectivity and created significantly more effective regression models using financial independent variables with selective institutions versus less selective institutions. Since community colleges are open admission schools, the results of this study follow closely with Gansemer-Topf and Schuh; thus, the data from the populations of open admissions institutions will create weaker predictive models than models created from the data of more selective institutions. This research indicates

that as long as community colleges have a policy of open admissions, creating an effective regression model to predict freshman retention using only financial allocation variables is unlikely.

A possible reason this study did not find a model predicting freshman retention from the use of financial allocation, is the population of colleges for this study needs stratification into subgroups or additional variables to discover any relationships. The institutions in this study include community colleges with a wide range of financial allocations, enrollment size, ethnic and gender breakdown, need for financial aid, and spending per student. Future studies could examine the relationships between these variables and freshman retention, but only for a specific range for each of these variables. Examples of limitations to these variables include limiting the study to institutions with enrollments between 1,000 and 5,000, or female enrollment within the range of 40% to 60%. Further study could attempt to create a logistic regression model that would explain the financial allocation utilized by high-retention colleges versus low-retention colleges.

Another reason this study may not have discovered a model predicting freshman retention by the allocation of financial variables is because it may take additional variables to uncover a relationship. Future studies could examine if using state policies, such as a common course numbering system, mandatory acceptance of community college graduates as juniors in four-year schools, or including the mission of the college (transfer, adult education, remediation, and job preparation), as independent variables increases the ability to explain freshman retention.

Conclusion Four

Total student enrollment, part-time student enrollment, full-time equivalent students (FTE), total expenditures per institution, and spending per student, for regionally accredited

community colleges in the Southern United States, ranged from very small to very large. The average student body for community colleges in the Southern United States consists of mostly white females. In addition, the average community college student does not receive financial aid. Those with aid are more likely to receive Pell Grant awards than student loans.

This conclusion is based on the results of objective four, which showed total community college student enrollment ranged from 113 to 48,169 students, while part-time student enrollment ranged from 19 to 34,113. Full-time equivalent student (FTE) enrollment ranged from 100 to 25,509. Objective four also indicated that expenditures per institution ranged from \$1,349,000 to \$279,327,000 per institution and spending per student ranged from \$5,131 to \$31,437. Objective Four also showed, in terms of racial enrollment by institution, white enrollment averaged 63.98%; black enrollment averaged 22.27% and Hispanic enrollment averaged 7.31%. Female enrollment averaged 61.60%. An average of 47.53% of the student population received federal financial aid, an average of 45.30% received Pell grants, and an average of 14.83% received federal loans.

A review of the relevant literature found the average number of students enrolled in community colleges is about 5,933 (Provasnik & Planty, 2008). Part-time students make up about 59% of the enrollment in community colleges (American Association of Community Colleges, 2010). The racial breakdown of community college students is about 61% white, 14% black, and 16% Hispanic (American Association of Community Colleges, 2010). About 57% of community college students are female (Chen & Thomas, 2001, p. 49) and the average age of a community college student is about 29 years old (American Association of Community Colleges, 2010). “Sixty-six percent of all undergraduates received some type of financial aid. For those who received any aid, the total average amount received was \$9,100. Fifty-two percent received

grants averaging \$4,900, and 38% took out an average of \$7,100 in student loans” (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009, p. 3). Approximately 21% of community college students received Pell Grants (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009).

Approximately 10% of community college students receive Federal Loans (Wei, Berkner, He, Lew, Cominole, & Siegel, 2009). For community colleges in SREB states, part-time enrollment averaged about 55.2%, female enrollment averaged 60.9%, white students made up 59.2%, black student consisted of 20.6%, and Hispanic students average 12.3% of enrollment (Marks, 2007). The results of this study in relation to demographic data for community colleges are reasonable when compared to the relevant literature.

As in conclusion one, the results from this study are averages from unweighted data, meaning a very large community college has the same value in calculating the mean as a very small institution. Future research should consider using weighted averages.

Conclusion Five

No relationship was found between various student body characteristics and freshman retention for community colleges in the SREB. There is no relationship between enrollment size, part-time enrollment, number of full-time equivalent students, ethnic, and gender composition, total spending, spending per FTE, and percentage of students on financial aid with freshman retention for community colleges in the SREB. Every relationship between any of the independent variables and freshman retention had “little if any correlation.”

The review of the relevant literature found that other studies have reported relationships between institutional characteristics and freshman retention. Bailey, Calcagno, Jenkins, & Leinbach (2006) found institutional size had a negative relationship with graduation rates. Bailey *et al.* stated that in community colleges, female part-time retention is significantly lower

than male. Once gender is controlled, part-time retention rates equal full-time retention rates. Female students have a higher probability of persistence, compared to male students (Chen & Thomas, 2001, p. 49). Horn (2009) found for community colleges overall, the odds of retaining black students was significantly lower than for white students and that there was a negative relationship between age and retention rate.

Fifty-five percent of community college students who receive financial aid persist. Gift aid in the form of scholarships and grants and work-study, as contrasted with loans, are associated with higher retention and graduate rates (The Pell Institute, 2004). “First-year Pell Grant recipients exhibited lower odds of leaving in the first year” (Horn, 2009, p. 43). “Loans seem to be helpful in encouraging white students to persist but do not positively affect completion rates for African American and Latino students” (Kuh, Kinzi, Buckley, Bridges, & Hayek, 2006, p. 102). The results of this study differ from the related literature on the topic from four-year institutions in that those studies were able to find a relationship between selected valuables and student success.

As in objective two, adding additional independent variables could discover a relationship with freshman retention. Future studies could examine additional independent variables that describe a college’s enrollment. These variables could include students in developmental courses, single mothers, and first-generation college students.

Conclusion Six

The results of this study, when using financial allocations by function and student body characteristics, found a regression model that explained a small percentage of freshman retention. While this model is statistically significant with a small effect size, it indicates no combination of financial allocations by function and institutional student body characteristics are

significantly related freshman retention for community colleges in SREB states. In addition to financial resources, this model analyzed enrollment size, racial and gender makeup, spending per student, and financial aid participation.

While this study discovered that well known institutional factors do not correlate to increased freshman retention, it is important to note that this study does not include an exhaustive list of possible factors explaining retention. The results of this study do provide community college decision makers with a list of factors that are not related to freshman retention.

Conclusion Seven

The dependent variable of freshman retention rates is not as relevant a measure of success for community colleges as the statistic is for four-year schools. It is odd the results of several studies on four-year schools show a strong and relevant relationship between financial allocation by function and retention rate, yet this study on community colleges did not discover such a relationship. If one takes the results of this study to the point of absurdity, one could conclude that any allocation of funding will not make a difference in community college retention rates and therefore any changes in amount or allocation of funding will not change institutional retention rates.

As mentioned in Chapter Two, three of the main missions of community colleges are to provide remediation, career and technical education, and transfer opportunities for students to four-year schools – all in an open admissions setting. In addition, community colleges provide higher education opportunities for nontraditional students, which encompass over 90% of institutional enrollment. As covered in Chapter Two, the independent variable of freshman retention does not capture a successful student transferring after completing remediation, gaining

employment with skills learned while enrolled at an institution, leaving a community college once he or she meets four-year college entrance requirements, or dropping down to part time enrollment status. Most importantly, as many community college advocates point out, the retention rate measure does not capture a community college student's intentions or goals for enrolling in college. Even though a student may successfully meet his or her pre-enrollment goals of completing remediation, gaining workforce skills, or meeting the requirements for transfer to a four-year school prior to reenrolling in a subsequent fall, the IPEDS retention rate formula does not capture these positive and desired outcomes. This conceptual omission may significantly understate the success of community colleges in helping enrollees meet their pre enrollment goals.

Additional research could attempt use the percentage of students successful in meeting his or her goals for enrolling in college as the dependent variable. The challenge of this project, as mentioned in Chapter Two, is there is no national clearinghouse for data on community college student transferring to other schools, success in using new skills to enter the workforce, or if a student met his or her intentions for enrolling in college prior to leaving the school.

Summary

The results of this study did not find a relationship or predictive model between allocation of financial resources and freshman retention. The results of this study did not find a relationship between selective descriptive variables and freshman retention. While the results of this study found a predictive model combining descriptive and financial variables, this model predicts such a small amount of freshman retention that the model has almost no value for community college decision makers.

At the start of Chapter One, there is a narrative about a community college president sitting in her office trying to decide how to best allocate her institution's resource to increase freshman

retention. After performing a review of the literature on the subject and completing a study to try to discover a “magic formula” to help her, the only guidance I can give this president is to use her best judgment.

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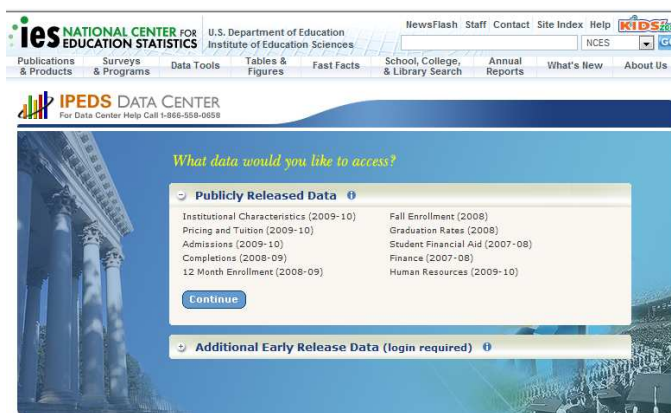
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APPENDIX A: DATA COLLECTION QUERY FORM

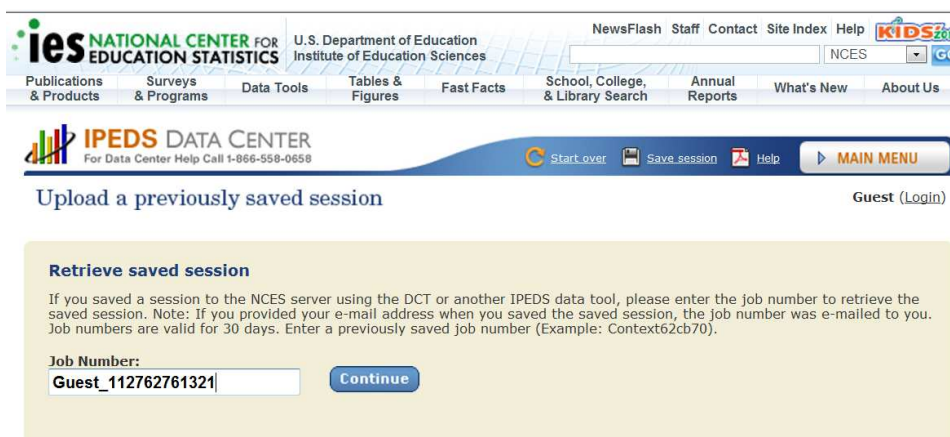
Go to the website: <http://nces.ed.gov/ipeds/datacenter/>



Select “upload a previously saved session.”



Select “continue.”



Enter “Guest_112762761321.”

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1. Select Institutions **2. Select Variables** **3. Output**

My Comparison Institution - None Selected **ADD**

Select Institutions - You have selected 402 institution(s) **VIEW/MODIFY**

Select Variables - Total 21 variables selected **ADD NEW VARIABLES** **VIEW/MODIFY**

Review the institutions and variables selected for your data set. You can add or remove variables/institutions, or, if you are happy with the current selections, click continue to receive your data set. **Continue**

Year 2008 **MODIFY**

Enrollment and retention rates: Fall 2008

This should return exactly 402 institutions and 21 variables. Select “continue.”

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1. Select Institutions **2. Select Variables** **3. Output**

My Comparison Institution - None Selected **ADD**

Select Institutions - You have selected 402 institution(s) **VIEW/MODIFY**

Select Variables - Total 21 variables selected **ADD NEW VARIABLES** **VIEW/MODIFY**

Download All

Year(s)	Rec./Var. Count	Survey/Section	Download
2008	402/26	Institutions (2008)	<input checked="" type="checkbox"/> CSV - DOWNLOAD <input type="checkbox"/> SAS - DOWNLOAD <input type="checkbox"/> STATA - DOWNLOAD <input type="checkbox"/> SPSS - DOWNLOAD <input type="checkbox"/> Imputation flags
		Enrollment and retention rates: Fall 2008	
		Revenues and expenditures: Fiscal year 2008	
		Student financial aid of full-time first-time degree or certificate-seeking students	

Select “download” and the “CSV.”

Save the data to the desired location. This data is in a compressed format. Once the data is uncompressed, any spreadsheet program can access it for analysis.

APPENDIX B: INSTITUTIONAL REVIEW BOARD APPROVAL FORM

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

– Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://www.lsu.edu/screeningmembers.shtml>

– A Complete Application Includes All of the Following:

- (A) Two copies of this completed form and two copies of part B thru E.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.
*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
- (D) The consent form that you will use in the study (see part 3 for more information.)
- (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>.)
- (F) IRB Security of Data Agreement: (<http://www.lsu.edu/irb/IRB%20Security%20of%20Data.pdf>)



Institutional Review Board
Dr. Robert Mathews, Chair
131 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.6792
irb@lsu.edu
lsu.edu/irb

1) Principal Investigator: Clayton C. Burton Rank: Ph.D. Student
Dept: Sch of Human Resource Ed & Mgmt Ph: 225-281-2134 E-mail: cburto2@lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each

Ph.D. Committee Chair: Dr. Joe Kotrlík, Professor, (225) 578-5753, Kotrlík@lsu.edu

IRB#	55156	LSU Proposal #
<input checked="" type="checkbox"/>	Complete Application	
<input checked="" type="checkbox"/>	Human Subjects Training	

3) Project Title: The Influence of Budget Allocations by Function on Freshman Student Retention Rates for Public Community Colleges for the Sixteen States in the Southern Region Education Board

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 7-27-2013

4) Proposal? (yes or no) ☐ If Yes, LSU Proposal Number
Also, if YES, either ☐ This application completely matches the scope of work in the grant
OR ☐ More IRB Applications will be filed later

5) Subject pool (e.g. Psychology students) Colleges in the Southern United States

*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Date 7/19/2010 (no per signatures)

** I certify my responses are accurate and complete. If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted <input checked="" type="checkbox"/> Not Exempted <input type="checkbox"/> Category/Paragraph 4		
Reviewer Mathews	Signature Robert C. Mathews	Date 7/25/10

APPENDIX C: ZERO-ORDER CORRELATIONS FOR ALL VARIABLES FOR OBJECTIVE FOUR

Table 9. Zero Order Correlations Among All Variables for Objective Four

Variable	1	2	3	4	5	6	7	8	9	10
1 Retention	1.000	0.166	0.187	0.239	-0.216	-0.039	-0.116	0.159	0.156	0.058
2 Total enrollment		1.000	0.944	-0.052	-0.116	0.253	-0.241	0.911	0.194	-0.078
3 Part-time enroll			1.000	-0.054	-0.153	0.338	-0.230	0.813	0.216	0.025
4 Percent white				1.000	-0.872	-0.173	-0.254	-0.119	-0.027	0.073
5 Percent black					1.000	-0.226	0.363	0.003	0.013	-0.035
6 Percent Hispanic						1.000	-0.127	0.157	-0.014	-0.017
7 Percent Women							1.000	-0.138	-0.157	0.049
8 Total core expense								1.000	0.180	-0.129
9 Percent Instruction									1.000	-0.096
10 Pct. Academic Supt.										1.000
11 Pct. Student Services										
12 Institutional Support										
13 Other Core Exp										
14 Percent Federal aid										
15 Percent Pell Grants										
16 Percent Fed Loan										
17 FTE's										
18 Spending per FTE										

(Table continues)

Variable	11	12	13	14	15	16	17	18
1 Retention	-0.107	0.026	-0.121	-0.123	-0.094	-0.067	0.143	-0.037
2 Total enrollment	-0.028	-0.182	-0.042	-0.321	-0.308	0.069	0.979	-0.426
3 Part-time enroll	-0.072	-0.112	-0.151	-0.379	-0.355	-0.039	0.858	-0.323
4 Percent white	-0.082	0.046	-0.018	-0.098	-0.103	0.118	-0.042	-0.181
5 Percent black	0.094	-0.015	0.014	0.235	0.255	-0.121	-0.091	0.253
6 Percent Hispanic	-0.054	-0.062	-0.043	-0.337	-0.372	-0.037	0.185	-0.084
7 Percent Women	0.083	0.072	0.060	0.254	0.263	-0.099	-0.232	0.266
8 Total core expense	-0.035	-0.165	-0.022	-0.242	-0.247	0.016	0.921	-0.119
9 Percent Instruction	-0.314	-0.162	-0.625	-0.145	-0.115	-0.203	0.167	0.006
10 Pct. Academic Supt.	0.019	-0.030	-0.365	-0.101	-0.099	-0.308	-0.132	0.099
11 Pct. Student Services	1.000	-0.136	-0.017	0.093	0.072	0.105	0.004	-0.065
12 Institutional Support		1.000	-0.288	-0.069	-0.057	-0.090	-0.215	0.210
13 Other Core Exp			1.000	0.185	0.151	0.316	0.027	-0.198
14 Percent Federal aid				1.000	0.961	0.292	-0.267	0.112
15 Percent Pell Grants					1.000	0.296	-0.261	0.092
16 Percent Fed Loan						1.000	0.133	-0.342
17 FTE's							1.000	-0.467
18 Spending per FTE								1.000

Note. N = 295. Because this study uses population data rather than randomly sampled data, significance tests were not appropriate for inferential analysis. However, significance is reported here as an arbitrary criterion in deference to its widespread use in social science for exploratory analysis of nonrandom data (Garson, 2009). *Italics* $p < .05$; **Bold** $p < .01$.

VITA

Clen Burton is the father of Clay and Shelby, boy and girl twins. He is married to the former Michelle Barkate and is a native of Baton Rouge, Louisiana.

Since 2004, he has served as the Vice-Chancellor of Finance and Administration for River Parishes Community College and as an adjunct accounting instructor. Prior to his employment in higher education, he worked in healthcare, public accounting, and the construction industry.

He has a doctorate in human resource education, a master's degree in accounting and a bachelor's degree in speech communication from Louisiana State University. Later in life, he earned an associate's degree in computer information systems from Bossier Parish Community College. He is a Certified Public Accountant, has passed the Certified Internal Auditor and the Certified Information Systems Auditor Exams, and is a Certified Microsoft Office Instructor.

In addition to being a member of the Gonzales Rotary Club, he enjoys following LSU football and officiated high school football for seven seasons. He also enjoys the outdoors and spending time with his children.